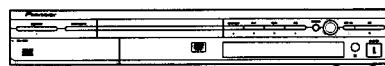


Service Manual



DVR-3100-S

ORDER NO.
RRV2843

DVD RECORDER

DVR-3100-S

THIS MANUAL IS APPLICABLE TO THE FOLLOWING MODEL(S) AND TYPE(S).

| Model | Type | Power Requirement | Region No. | Serial No. Please confirm 3rd & 4th alphabetical letters. |
|------------|------|-------------------|------------|---|
| DVR-3100-S | WY | AC220-240V | 2 | &&TT#####S |
| DVR-3100-S | WYXU | AC220-240V | 2 | &&PG#####S |
| DVR-3100-S | WVXU | AC220-240V | 2 | &&PG#####S |

- When servicing this model, some service procedures may reset the settings that customer set (*) to the factory default settings. Make sure to explain this to the customer.

(*) : Initial Setup (Clock Setting, Remote Control Set, Channel settings, Video Out settings, Audio In settings, Audio Out settings, Language settings)

Refer to the chapter 12 of the Operating Instructions for more details.



For details, refer to "Important symbols for good services".

SAFETY INFORMATION

LITHIUM BATTERY NOTICE

CAUTION

Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.

When replacing the lithium batteries, follow the note below. Dispose of the used battery promptly. Keep away from children. Do not disassemble and do not dispose of in fire.

The battery used in this device may present a fire or chemical hazard if mistreated. Do not recharge, disassemble, heat above 100°C or incinerate. Replace only with the same Part Number. Use of another battery may present a risk of fire or explosion.

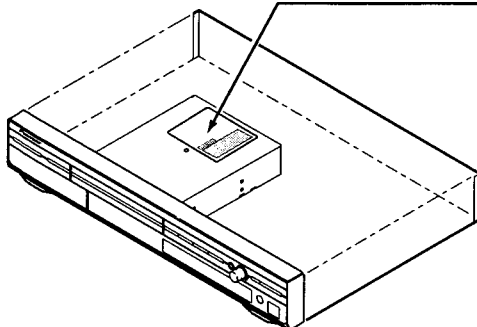
Note : The lithium battery installation position is shown in the exploded views.

LABEL CHECK

WARNING!
DEVICE INCLUDES LASER DIODE WHICH EMITS INVISIBLE INFRARED RADIATION WHICH IS DANGEROUS TO EYES. THERE IS A WARNING SIGN ACCORDING TO PICTURE 1 INSIDE THE DEVICE CLOSE TO THE LASER DIODE.



LASER
Picture 1
Warning sign for laser radiation



CAUTION: CLASS 1 LASER PRODUCT. LASER RADIATION WHEN OPEN. AVOID EXPOSURE TO THE BEAM.
VORSICHT: KLASSE 1 LASER-PRODUKT. LASERSTRAHLUNG BEI OFFENEM DECKEL. VERMEIDEN SIE DEN STRAHLEN AUSSETZEN.
ADVERTENCIA: CLASE 1 PRODUCTO LASER. RADIACIÓN DE LASER CUANDO SE ABRE LA CUBIERTA. EVITE LA EXPOSICIÓN A LOS RAYOS LASER.
VARNING: KLASSE 1 LASER-PRODUKT. LASERSTRAHLUNG BEI OFFENEM DECKEL. VERMEIDEN SIE DEN STRAHLEN AUSSETZEN.
ATTENTION: CLASS 1 LASER PRODUCT. LASER RADIATION WHEN OPEN. AVOID EXPOSURE TO THE BEAM.
PRECAUTION: CLASS 1 LASER PRODUCT. LASER RADIATION WHEN OPEN. AVOID EXPOSURE TO THE BEAM.

CLASS 1 LASER PRODUCT
LASER KLASSE 1

DRW2179

IMPORTANT
THIS PIONEER APPARATUS CONTAINS LASER OF CLASS 1. SERVICING OPERATION OF THE APPARATUS SHOULD BE DONE BY A SPECIALLY INSTRUCTED PERSON.

LASER DIODE CHARACTERISTICS
MAXIMUM OUTPUT POWER : 50 mw
WAVELENGTH : 658 nm

Additional Laser Caution

1. The ON/OFF(ON:low level,OFF:high level) status of the CLAMP signals for detecting the loading state are detected by the drive CPUs, and the design prevents laser diode oscillation when the CLAMP signal turns OFF. In normal operation, if no disc is clamped, the laser diode oscillation is disabled. However, the interlock does not always operate in the test mode.
2. When the cover is opened, close viewing of the objective lens with the naked eye will cause exposure to a Class 3A laser beam.

[Important symbols for good services]

In this manual, the symbols shown-below indicate that adjustments, settings or cleaning should be made securely. When you find the procedures bearing any of the symbols, be sure to fulfill them:

1. Product safety

You should conform to the regulations governing the product (safety, radio and noise, and other regulations), and should keep the safety during servicing by following the safety instructions described in this manual.

2. Adjustments

To keep the original performances of the product, optimum adjustments or specification confirmation is indispensable. In accordance with the procedures or instructions described in this manual, adjustments should be performed.

3. Cleaning

For optical pickups, tape-deck heads, lenses and mirrors used in projection monitors, and other parts requiring cleaning, proper cleaning should be performed to restore their performances.

4. Shipping mode and shipping screws

To protect the product from damages or failures that may be caused during transit, the shipping mode should be set or the shipping screws should be installed before shipping out in accordance with this manual, if necessary.

5. Lubricants, glues, and replacement parts

Appropriately applying grease or glue can maintain the product performances. But improper lubrication or applying glue may lead to failures or troubles in the product. By following the instructions in this manual, be sure to apply the prescribed grease or glue to proper portions by the appropriate amount. For replacement parts or tools, the prescribed ones should be used.

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1. SPECIFICATIONS

General

System.....DVD-Video, DVD-R/RW, Video-CD,
CD, CD-R/RW (WMA, MP3, JPEG, CD-DA)
Power requirements.....220-240 V, 50/60 Hz
Power consumption.....35 W
Power consumption in standby mode.....0.7 W (FL off)
Weight.....4.4 kg
Dimensions.....420 (W) x 69 (H) x 341 (D) mm
Operating temperature.....+5°C to +35°C
Operating humidity.....5% to 85% (no condensation)
TV system.....PAL/SECAM/NTSC (external input only)

Recording

Recording format.....DVD Video Recording
DVD-VIDEO

Recordable discs

DVD-RW (DVD Re-recordable disc)
DVD-R (DVD Recordable disc)

Video recording format

Sampling frequency.....13.5MHz
Compression format.....MPEG

Audio recording format

Sampling frequency.....48kHz
Compression format.....Dolby Digital or Linear PCM
(uncompressed)

Recording time

Fine (FINE).....Approx. 1 hour
Standard Play (SP).....Approx. 2 hours
Long Play (LP).....Approx. 4 hours
Extended Play (EP).....Approx. 6 hours
Manual Mode (MN).....Approx. 1-6 hours

Tuner

Receiveable channels

| | PAL B/G | | PAL I | |
|------------|---------------|--|---------------|-----------------------------|
| | Frequency | Channel | Frequency | Channel |
| VHF (low) | 47 - 89 MHz | E2 - E4 X - Z | 44 - 89 MHz | A - C X - Z |
| VHF (high) | 104 - 300 MHz | E5 - E12 S1 - S20 M1 - M10 U1 - U10 | 104 - 300 MHz | D - J 11, 13 S1 - S20 |
| Hyper | 302 - 470 MHz | S21 - S41 | 302 - 470 MHz | S21 - S41 |
| UHF | 470 - 862 MHz | E21 - E69 | 470 - 862 MHz | E21 - E69 |

| | SECAM L | | SECAM D/K | |
|------------|---------------|-----------------|---------------|----------------------|
| | Frequency | Channel | Frequency | Channel |
| VHF (low) | 49 - 65 MHz | 2 - 4 | 49 - 94 MHz | R1 - R5 |
| VHF (high) | 104 - 300 MHz | 5 - 10 B - Q | 104 - 300 MHz | R6 - R12 S1 - S20 |
| Hyper | 300 - 470 MHz | S21 - S41 | 302 - 470 MHz | S21 - S41 |
| UHF | 470 - 862 MHz | 21 - 69 | 470 - 862 MHz | E21 - E69 |

STEREO
B/G - A2
I - NICAM
L - NICAM
B/G - NICAM
D/K - NICAM

Timer

Programs.....1 month/32 programs
Clock.....Quartz lock (24-hour digital display)
Power off memory.....Approx. 5 years (after manufacture)

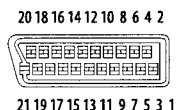
Input/Output

VHF/UHF antenna input/output terminal.....VHF/UHF set
75 Ω (IEC connector)
Video input.....Input 1, 3 (rear), 2 (front)
Input level.....1 Vp-p (75 Ω)
Jacks.....AV connector 2 (Input 1),
RCA jack (Input 2,3)
Video output.....Output 1,2
Output level1 Vp-p (75 Ω)
Jacks.....AV connector (Output 1)
RCA jack (Output 2)
S-Video input.....Input 1, 3 (rear), 2 (front)
Y (luminance) - Input level.....1 Vp-p (75 Ω)
C (colour) - Input level.....286 mVp-p (75 Ω)
Jacks.....AV connector 2 (Input 1),
4 pin mini DIN (Input 2,3)
S-Video output.....Output 1,2
Y (luminance) - Output level.....1 Vp-p (75 Ω)
C (colour) - Output level.....286 mVp-p (75 Ω)
Jacks.....AV connector 1 (Output 1),
4 pin mini DIN (Output 2)
Audio input.....Input 1, 3 (rear), 2 (front) L/R
Input level
During audio input.....2V rms
(Input impedance: more than 22 kΩ)
Jacks.....AV connector 2 (Input 1),
RCA jacks (Inputs 2,3)

Audio output.....Output 1,2 L/R
 During audio output.....2V rms
 (Output impedance: less than 1.5 kΩ)
 A Jacks.....AV connector 1 (output 1),
 RCA jacks (output 2)
 Control input.....Mini jack
 DV input/output.....4 pin
 (i.LINK/IEEE 1394 standard)

AV Connectors (21-pin connector assignment)

AV connector input/output.....21-pin connector
 This connector provides the video and audio signals for
 connection to a compatible colour TV or monitor.



PIN no.

1.....Audio 2/R out
 11.....G* out
 3.....Audio 1/L out
 15.....R* or C* out
 4.....GND
 17.....GND
 7.....B* out
 19.....Video out or Y* out
 8.....Status
 21.....GND

* : AV CONNECTOR 1 (RGB-TV is output)

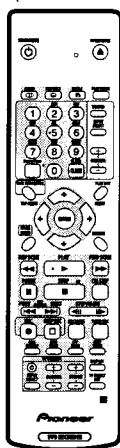
Supplied accessories

Remote control.....1
 Dry cell batteries (AA/R6P).....2
 Audio / Video cable (red/white/yellow).....1
 RF antenna cable.....1
 Power cable.....1
 Operating Instructions.....1
 Warranty card.....1

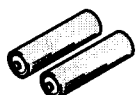
Note: The specifications and design of this product are
 subject to change without notice, due to improvement.

Accessories

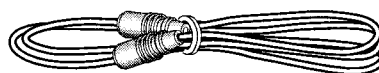
- Remote control ×1
 (VXX2884 : WYXU/WY types)
 (VXX2883 : WVXU type)



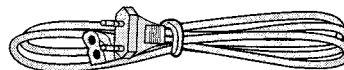
- Dry cell batteries ×2
 (AA/R6P)



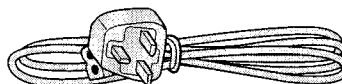
- RF antenna cable(PAL) ×1
 (VDE1075)



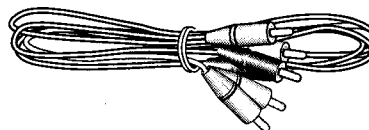
- Power cable ×1
 (ADG1154 : WYXU/WY types)



(ADG1156 : WVXU type)



- Audio / Video cable(1.5m) ×1
 (red/white/yellow)
 (VDE1077)



■ 5 ■ 6 ■ 7 ■ 8 ■

A

■

B

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C

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D

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E

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F

■ 5 ■ 6 **DVR-3100-S** 7 ■ 8 7 ■

2. EXPLODED VIEWS AND PARTS LIST

NOTES: • Parts marked by "NSP" are generally unavailable because they are not in our Master Spare Parts List.

• The Δ mark found on some component parts indicates the importance of the safety factor of the part.

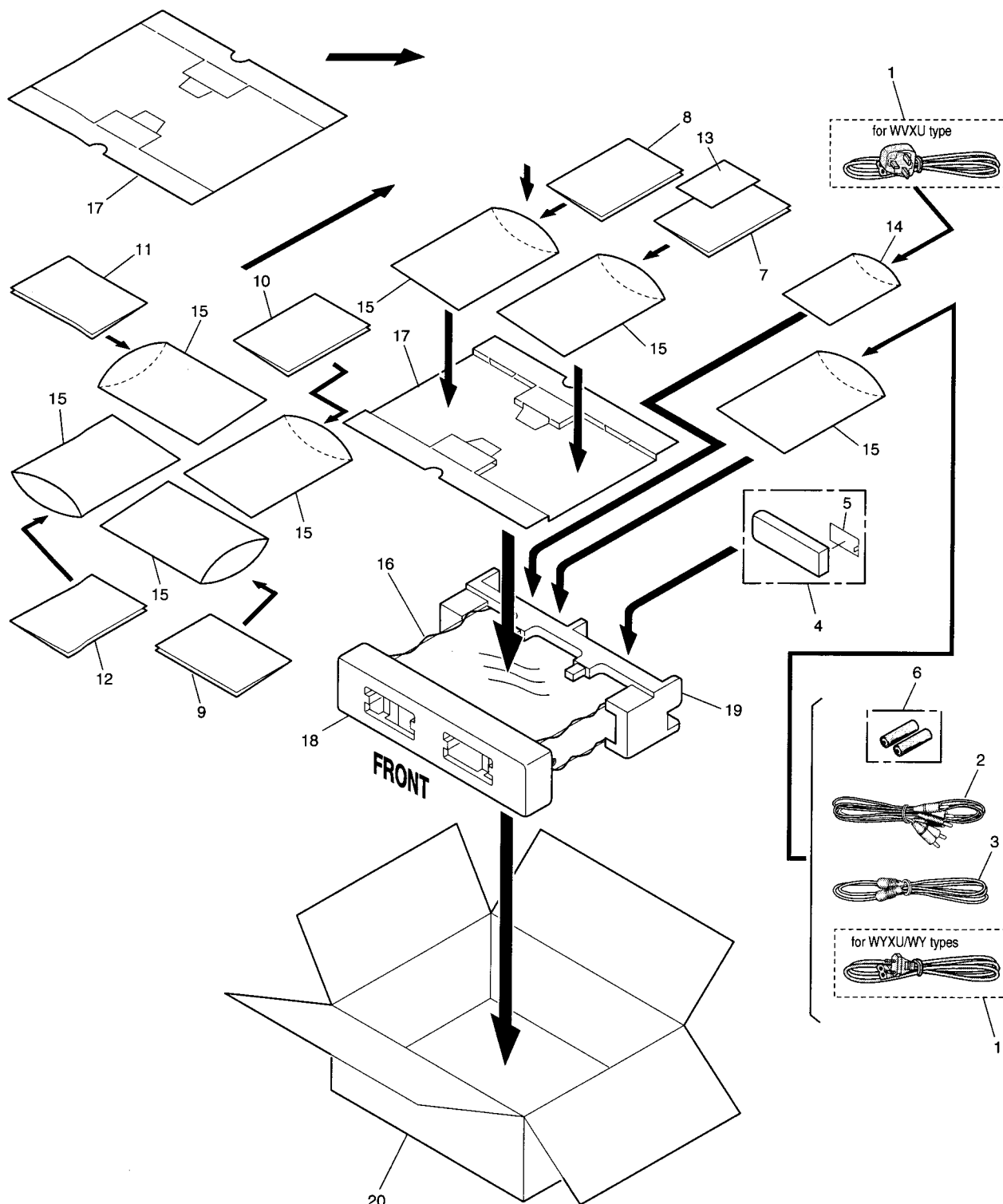
Therefore, when replacing, be sure to use parts of identical designation.

• Screws adjacent to ∇ mark on product are used for disassembly.

• For the applying amount of lubricants or glue, follow the instructions in this manual.

(In the case of no amount instructions, apply as you think it appropriate.)

2.1 PACKING



PACKING parts List

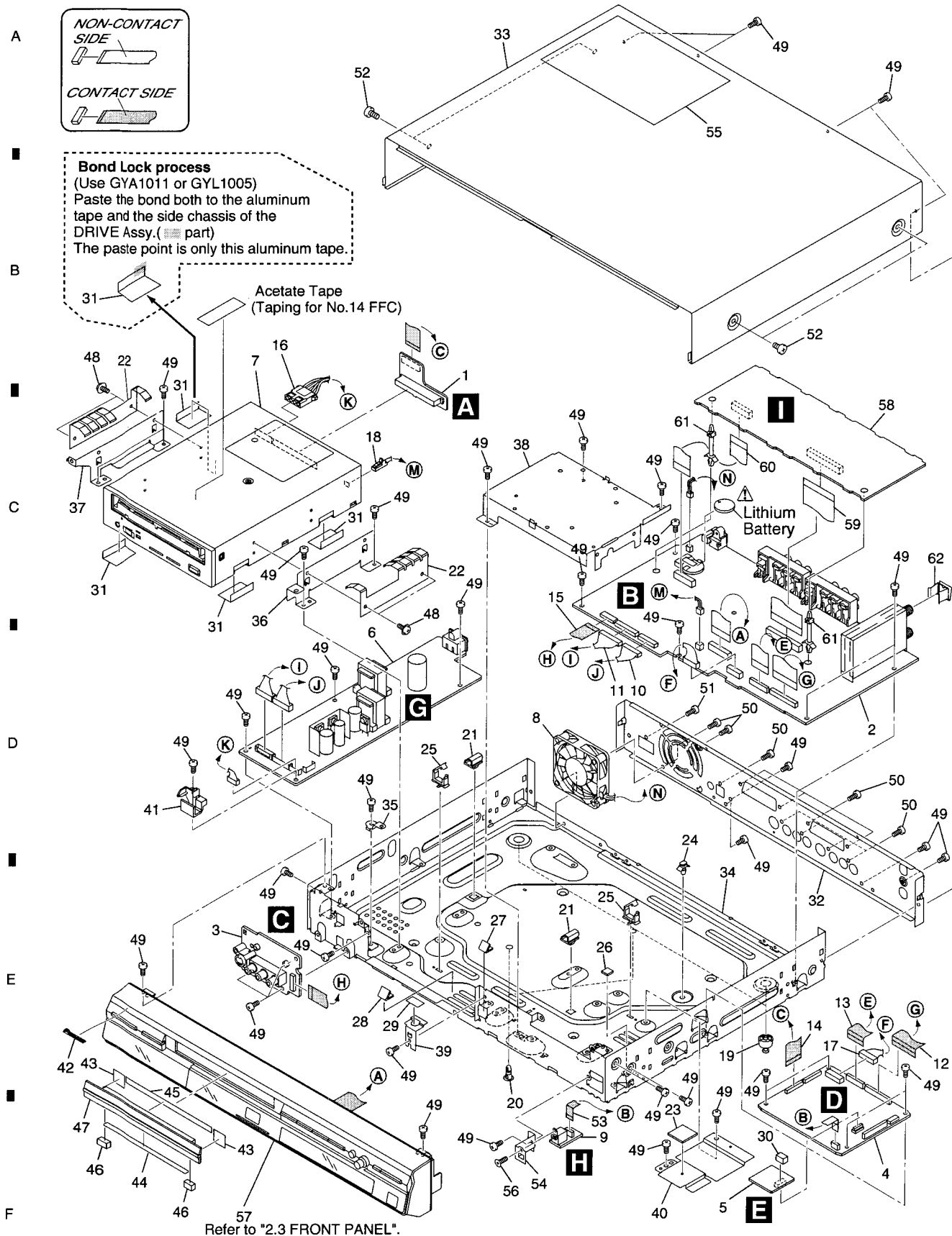
| Mark No. | Description | Part No. | Mark No. | Description | Part No. |
|----------|----------------------------------|-----------------------|----------|----------------------------------|-----------------------|
| ⚠ 1 | Power Cable | See Contrast table(2) | 11 | Operating Instructions (Dutch) | See Contrast table(2) |
| 2 | Audio/Video Cable | VDE1077 | 12 | Operating Instructions (Spanish) | See Contrast table(2) |
| 3 | RF Antenna Cable | VDE1075 | NSP 13 | Warranty Card | ARY7065 |
| 4 | Remote Control | See Contrast table(2) | NSP 14 | Cord Sheet | See Contrast table(2) |
| 5 | Battery Cover | AZA7424 | 15 | Polyethylene Bag | VHL1051 |
| NSP 6 | Dry Cell Batteries (R6P,AA) | VEM1030 | 16 | Mirror Sheet | VHL1006 |
| 7 | Operating Instructions (English) | See Contrast table(2) | 17 | Accessory Case | VHC1112 |
| 8 | Operating Instructions (French) | See Contrast table(2) | 18 | Front Pad | See Contrast table(2) |
| 9 | Operating Instructions (German) | See Contrast table(2) | 19 | Rear Pad | See Contrast table(2) |
| 10 | Operating Instructions (Italian) | See Contrast table(2) | 20 | Packing Case | See Contrast table(2) |

(2) CONTRAST TABLE

DVR-3100-S/WY, WYXU and WVXU are constructed the same except for the following :

| Mark | No. | Symbol and Description | DVR-3100-S/WY | DVR-3100-S/WYXU | DVR-3100-S/WVXU |
|------|-----|----------------------------------|---------------|-----------------|-----------------|
| ⚠ | 1 | Power Cord | ADG1154 | ADG1154 | ADG1156 |
| | 4 | Remote Control | VXX2884 | VXX2884 | VXX2883 |
| | 7 | Operating Instructions (English) | VRB1316 | VRB1316 | VRB1318 |
| | 8 | Operating Instructions (French) | VRE1101 | VRE1101 | Not used |
| | 9 | Operating Instructions (German) | VRE1103 | VRE1103 | Not used |
| | 10 | Operating Instructions (Italian) | VRE1105 | VRE1105 | Not used |
| | 11 | Operating Instructions (Dutch) | VRE1107 | VRE1107 | Not used |
| | 12 | Operating Instructions (Spanish) | VRE1109 | VRE1109 | Not used |
| NSP | 14 | Cord Sheet | Not used | Not used | VEG-012 |
| | 18 | Front Pad | VHA1348 | VHA1346 | VHA1346 |
| | 19 | Rear Pad | VHA1349 | VHA1347 | VHA1347 |
| | 20 | Packing Case | VHG2445 | VHG2417 | VHG2416 |

2.2 EXTERIOR



EXTERIOR parts List

| Mark No. | Description | Part No. | Mark No. | Description | Part No. | |
|----------|----------------------|-----------------------|----------|---------------------|-----------------------|---|
| 1 | ATAB ASSY | VWV1968 | 33 | Bonnet Case | VXX2897 | A |
| 2 | TUJB ASSY | VWV1962 | NSP 34 | Base Chassis | See Contrast table(2) | |
| 3 | FRJB ASSY | VWV1965 | 35 | PCB Base | VNE2278 | |
| 4 | MAIN ASSY | VWV1971 | NSP 36 | Writer Stay R | VNE2318 | |
| 5 | MHLP ASSY | VWV1991 | NSP 37 | Writer Stay L | VNE2319 | |
| ⚠ 6 | POWER SUPPLY UNIT | VWR1374 | NSP 38 | HDD Stay | VNE2320 | |
| 7 | DRIVE ASSY R6 | VXX2898 | NSP 39 | Bonnet Angle | VNE2321 | |
| 8 | DC FAN Motor | VXM1109 | NSP 40 | Heatsink | VNH1070 | |
| 9 | DVJB ASSY | VWV1967 | | | | |
| 10 | Connector Assy | PF08EE-D25 | 41 | Cable Holder | VNK5330 | |
| | | | 42 | Pioneer Name Plate | VAM1136 | B |
| 11 | Connector Assy | PF13PP-D25 | 43 | Tray Sheet A | VEC2346 | |
| 12 | Flexible Cable (32P) | VDA1975 | 44 | Tray Sheet B | VEC2358 | |
| 13 | Flexible Cable (21P) | VDA1976 | 45 | Tray Sheet C | VEC2395 | |
| 14 | Flexible Cable (40P) | VDA1977 | | | | |
| 15 | Flexible Cable (15P) | VDA1980 | 46 | Tray Sheet D | VEC2396 | |
| | | | 47 | Tray Panel Assy | VXA2602 | |
| 16 | Housing Assy (4P) | VKP2313 | 48 | Screw | AMZ30P060FMC | |
| 17 | Housing Assy (8P) | VKP2314 | 49 | Screw | BBZ30P060FMC | |
| 18 | Housing Assy (2P) | VKP2315 | 50 | Screw | BPZ30P080FZK | |
| 19 | Leg Assy | AEC7113 | | | | |
| NSP 20 | PCB Holder | PNW1706 | 51 | Screw | PPZ30P080FMC | C |
| | | | 52 | Screw | BCZ40P060FN | |
| NSP 21 | P. Plate Holder | PNY-405 | 53 | Flexible Cable (7P) | VDA1979 | |
| 22 | Earth Plate | VBK1148 | NSP 54 | DV Angle | VNE2322 | |
| 23 | Radiation Sheet | VEB1360 | 55 | Bonnet Label | See Contrast table(2) | |
| 24 | Card Spacer | VEC1708 | | | | |
| NSP 25 | Clamp | VEC2362 | 56 | Screw | VBA1088 | |
| | | | NSP 57 | Front Panel Assy | See Contrast table(2) | |
| 26 | Heatsink Cushion | VEC2363 | 58 | SCRB ASSY | VWV1958 | |
| 27 | Gasket A | VEC2382 | 59 | Flexible Cable(35P) | VDA1982 | |
| 28 | Gasket B | VEC2393 | 60 | Flexible Cable(15P) | VDA1983 | |
| 29 | Gasket Sheet | VEC2394 | | | | |
| 30 | M Cushion A | VEC2398 | NSP 61 | Spacer 40 | PNW2488 | D |
| | | | 62 | Earth Plate | VBK1149 | |
| 31 | Aluminum tape | VEF1056 | | | | |
| 32 | Rear Panel | See Contrast table(2) | | | | |

(2) CONTRAST TABLE

DVR-3100-S/WY, WYXU and WVXU are constructed the same except for the following :

| Mark | No. | Symbol and Description | DVR-3100-S/WY | DVR-3100-S/ WYXU | DVR-3100-S/ WVXU |
|------|-----|---|---------------|---------------------|---------------------|
| NSP | 32 | Rear Panel | VNA2674 | VNA2610 | VNA2610 |
| | 34 | Base Chassis | VNB1040 | VNB1039 | VNB1039 |
| | 55 | Bonnet Label | VRW1990 | VRW1990 | VRW1987 |
| NSP | 57 | Front Panel Assy | VXA2634 | Not used | Not used |
| | | (WYXU and WVXU types are individual parts.) | | | |

2.3 FRONT PANEL

A

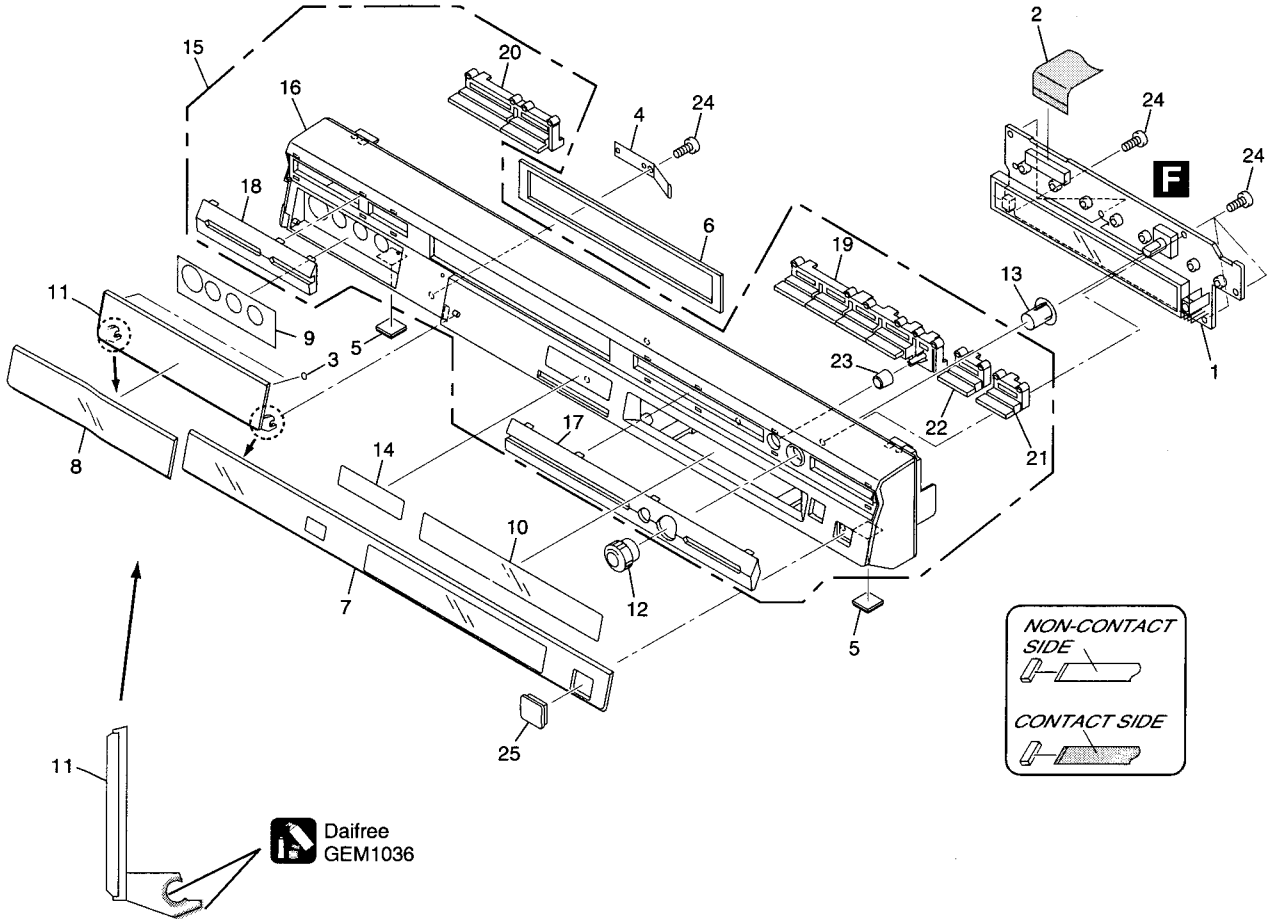
B

C

D

E

F



FRONT PANEL parts List

| <u>Mark No.</u> | <u>Description</u> | <u>Part No.</u> | <u>Mark No.</u> | <u>Description</u> | <u>Part No.</u> |
|-----------------|----------------------|-----------------------|-----------------|--------------------|-----------------|
| 1 | FLKY ASSY | VWG2443 | 15 | Flont Panel Assy | VXA2616 |
| 2 | Flexible Cable (19P) | VDA1974 | NSP 16 | Front Panel | VNK5361 |
| 3 | Rubber Sheet | AEB7054 | 17 | Front Cover R | VNK5360 |
| 4 | Door Spring | VBK1144 | 18 | Front Cover L | VNK5358 |
| 5 | Rubber Foot | VEB1349 | 19 | Main Key S | VNK5312 |
| 6 | Drive Sheet | VEC2345 | 20 | Power Key S | VNK5313 |
| 7 | FL Lens | VEC2352 | 21 | Rec Key | VNK5314 |
| 8 | Door Lens | See Contrast table(2) | 22 | Stop Key S | VNK5315 |
| 9 | Jack Sheet | VEC2381 | 23 | Function Cover | VNK5318 |
| 10 | FL Filter | VEC2354 | 24 | Screw | BPZ30P080FZK |
| 11 | Jack Door | VNK5309 | 25 | DV Cover | VNK5355 |
| 12 | JOG Dial S | VNK5316 | | | |
| 13 | JOG Base | VNK5317 | | | |
| 14 | Hologram Label | VRW1962 | | | |

(2) CONTRAST TABLE

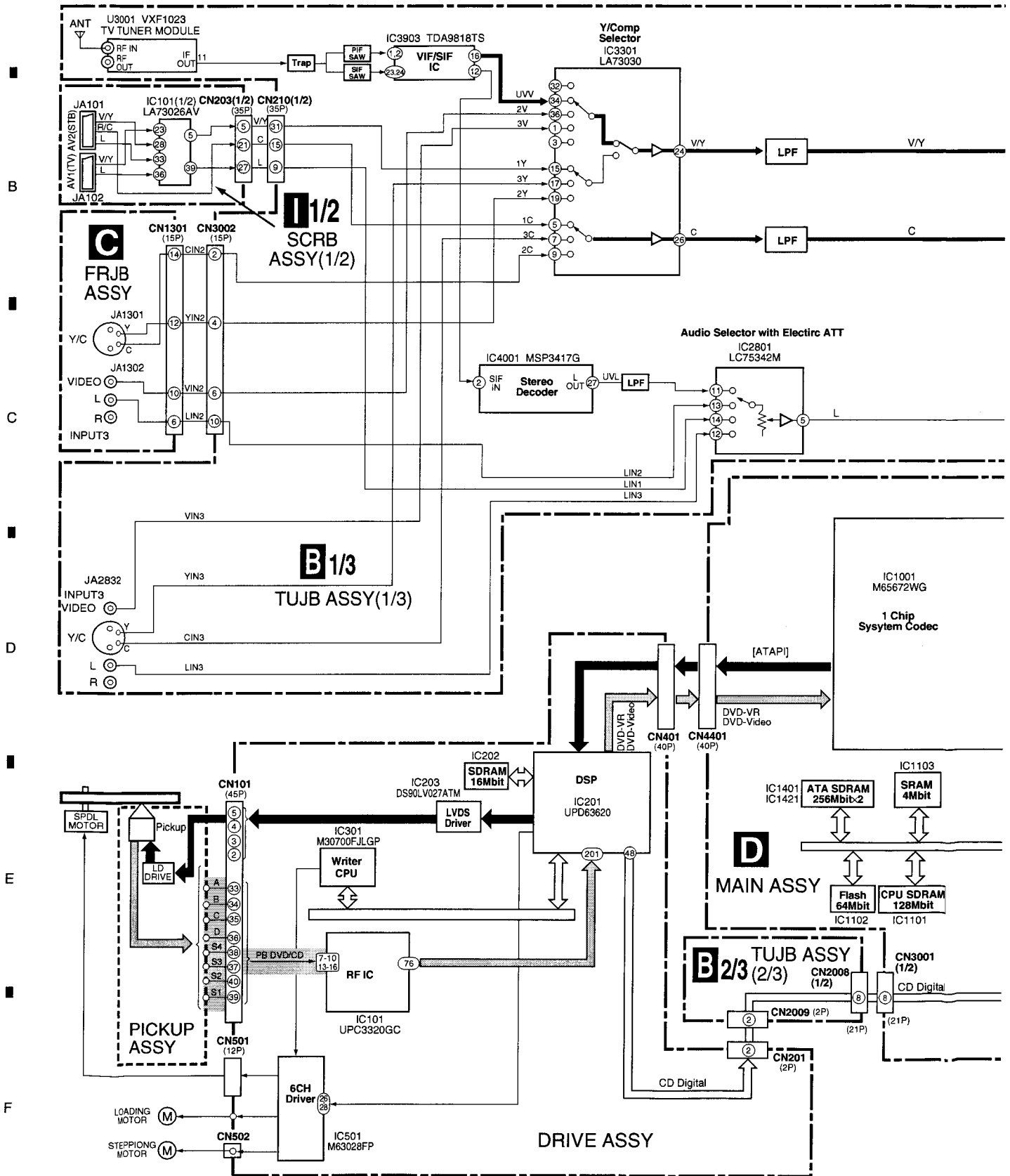
DVR-3100-S/WY, WYXU and WVXU are constructed the same except for the following :

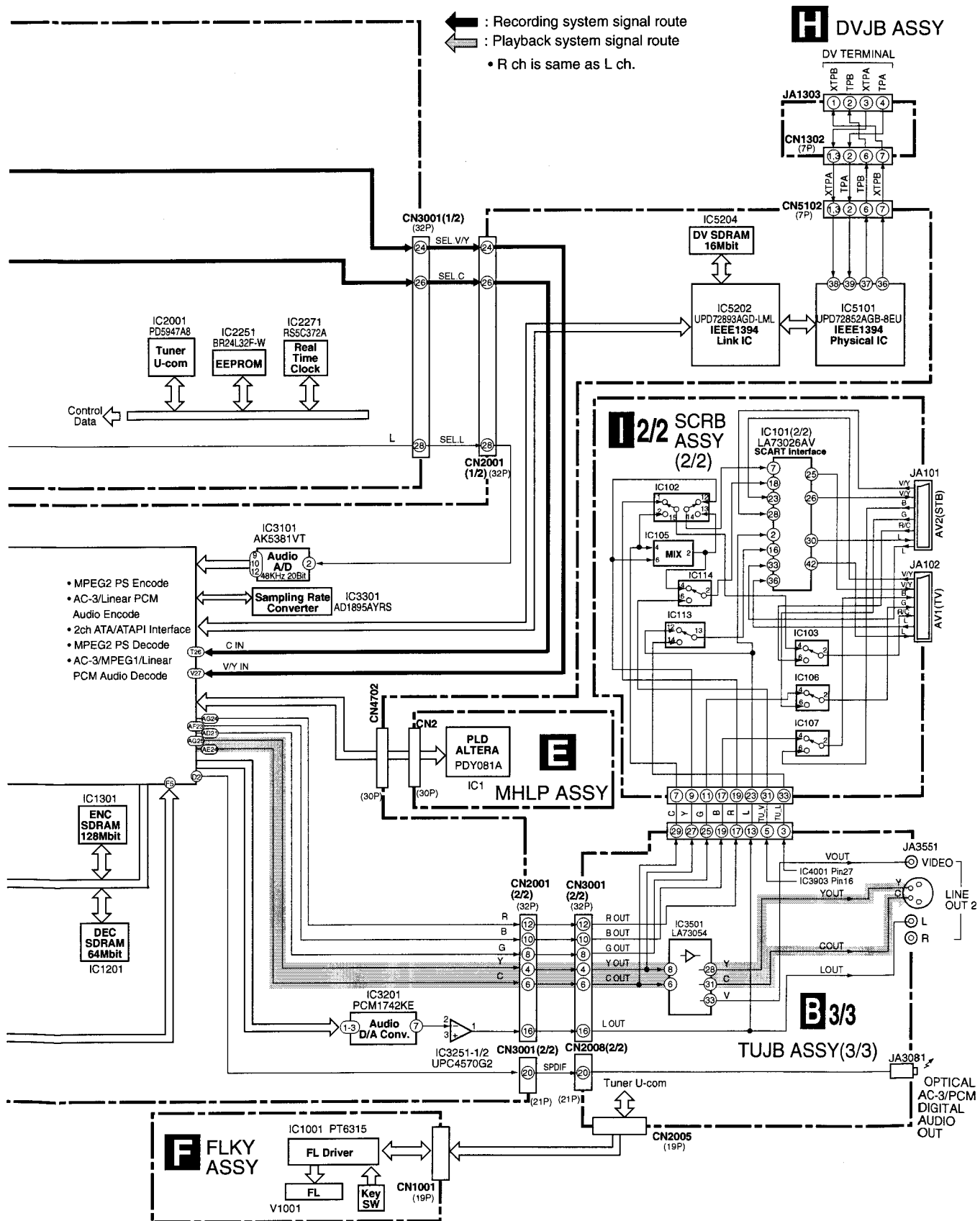
| Mark | No. | Symbol and Description | DVR-3100-S/WY | DVR-3100-S/ WYXU | DVR-3100-S/ WVXU |
|------|-----|------------------------|---------------|---------------------|---------------------|
| | 8 | Door Lens | VEC2377 | VEC2377 | VEC2376 |

3. BLOCK DIAGRAM AND SCHEMATIC DIAGRAM

3.1 BLOCK DIAGRAM

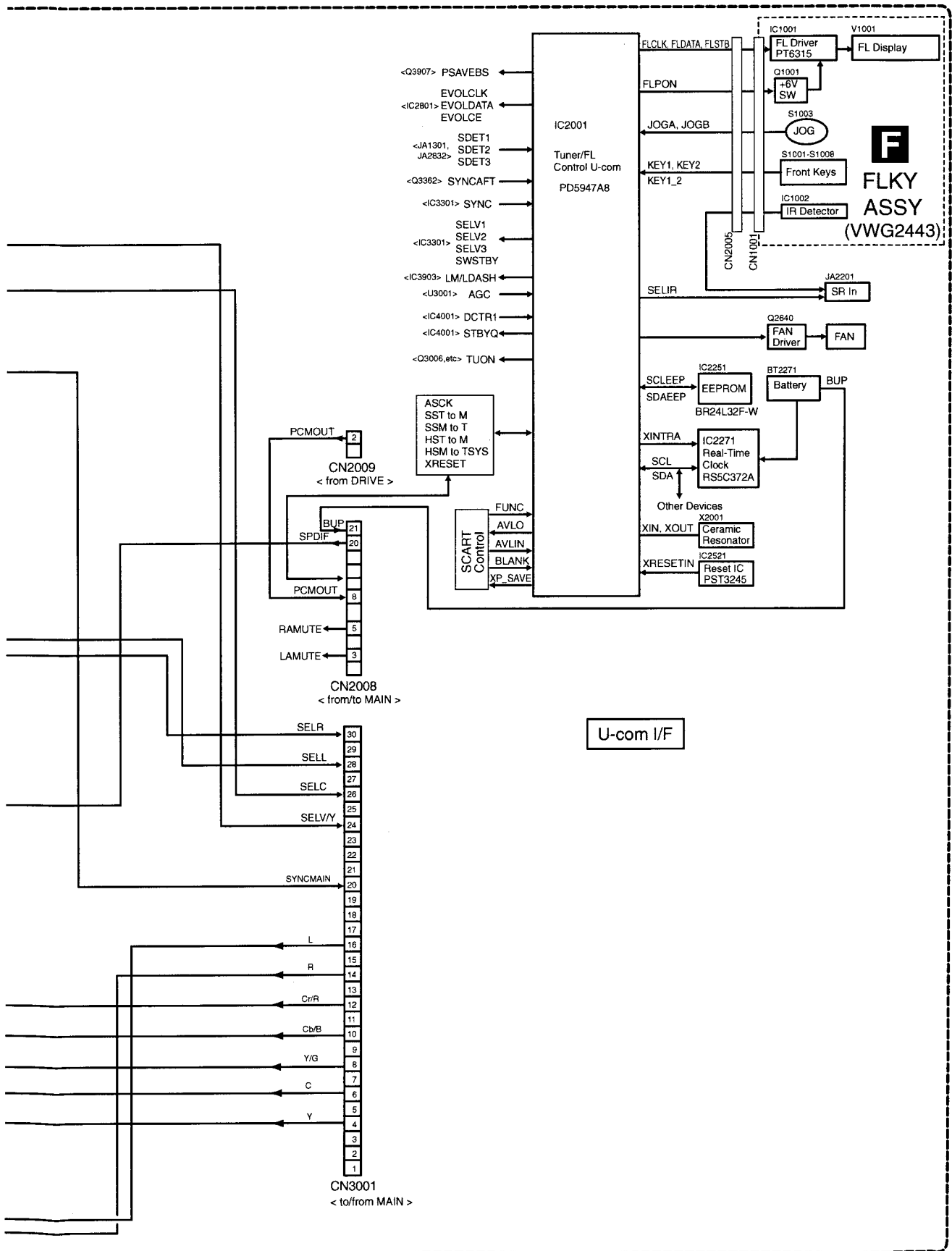
3.1.1 OVERALL BLOCK DIAGRAM



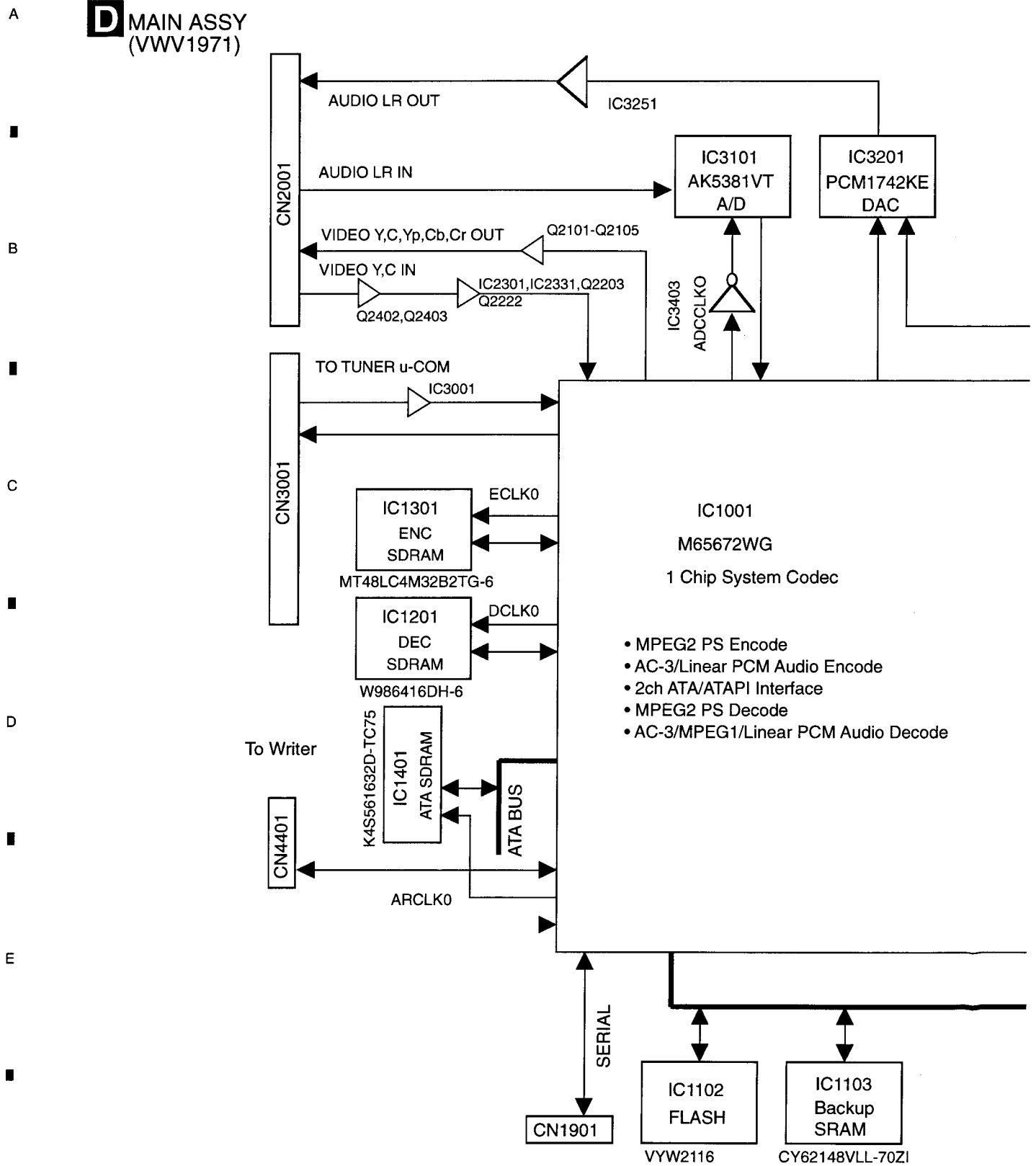


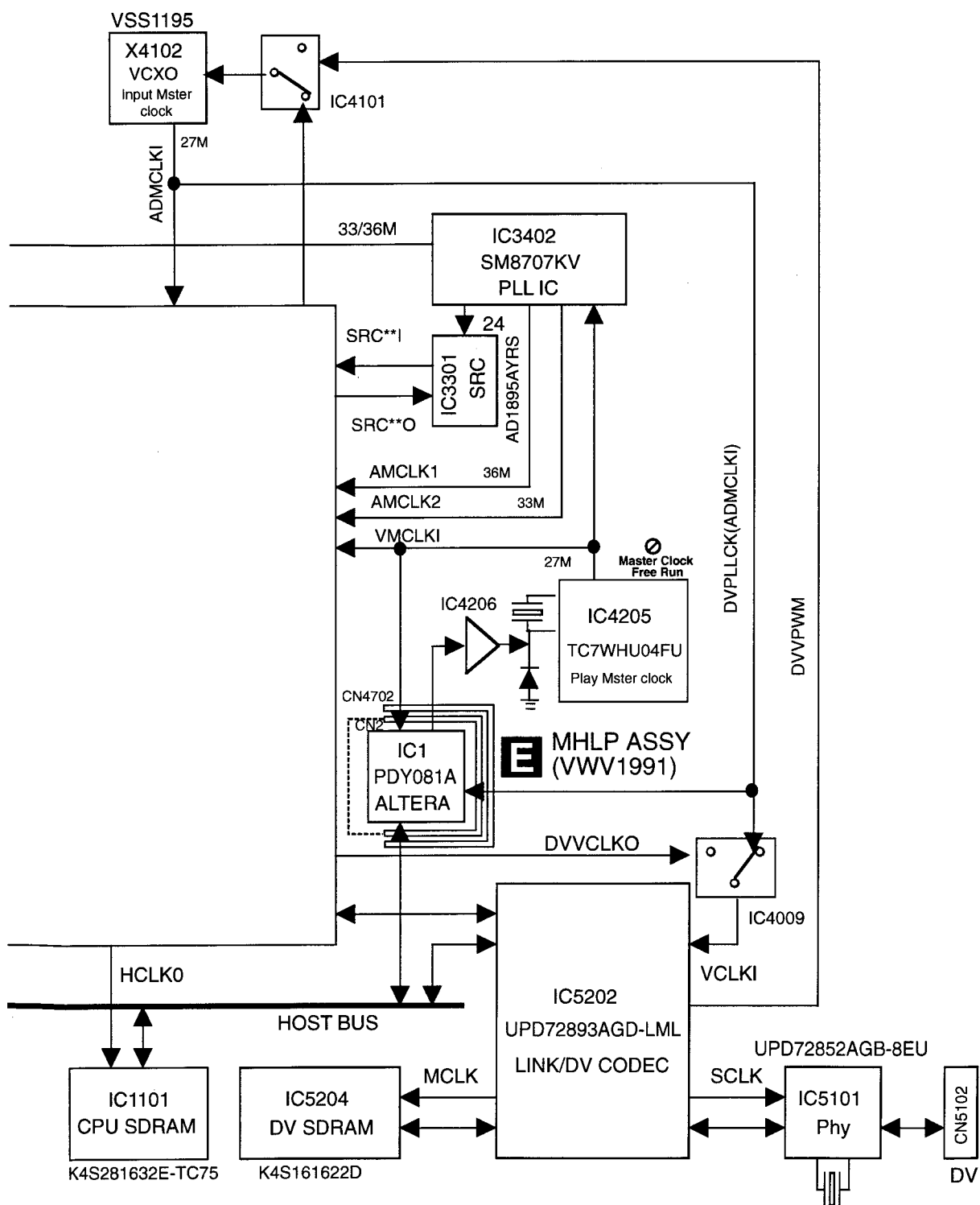
4





3.1.3 MAIN ASSY BLOCK DIAGRAM





20





5



6



7



8



A



B



C



D



E



F



5



6



7



8



21

DVR-3100-S

3.2 ATAB ASSY and OVERALL WIRING DIAGRAM

A

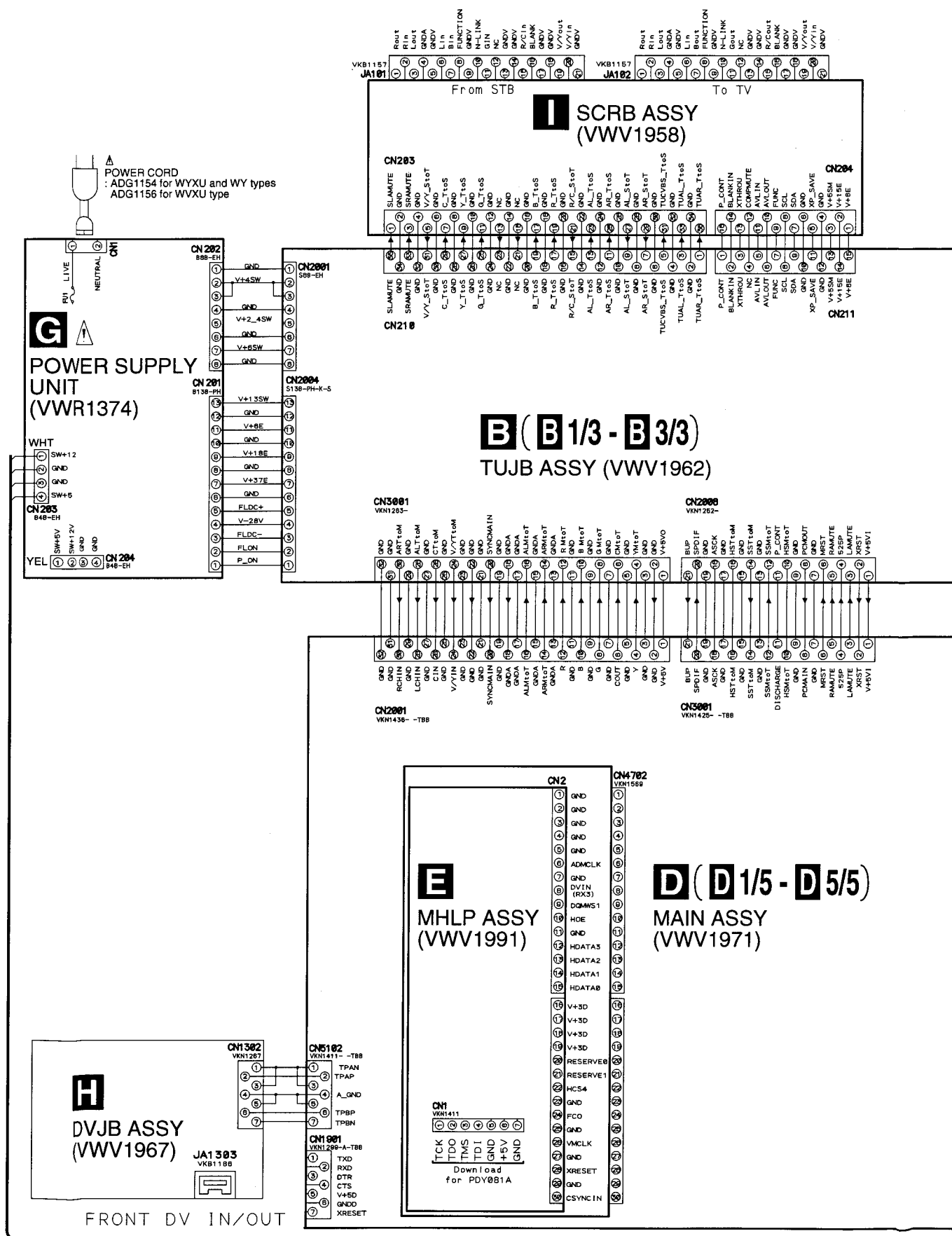
B

C

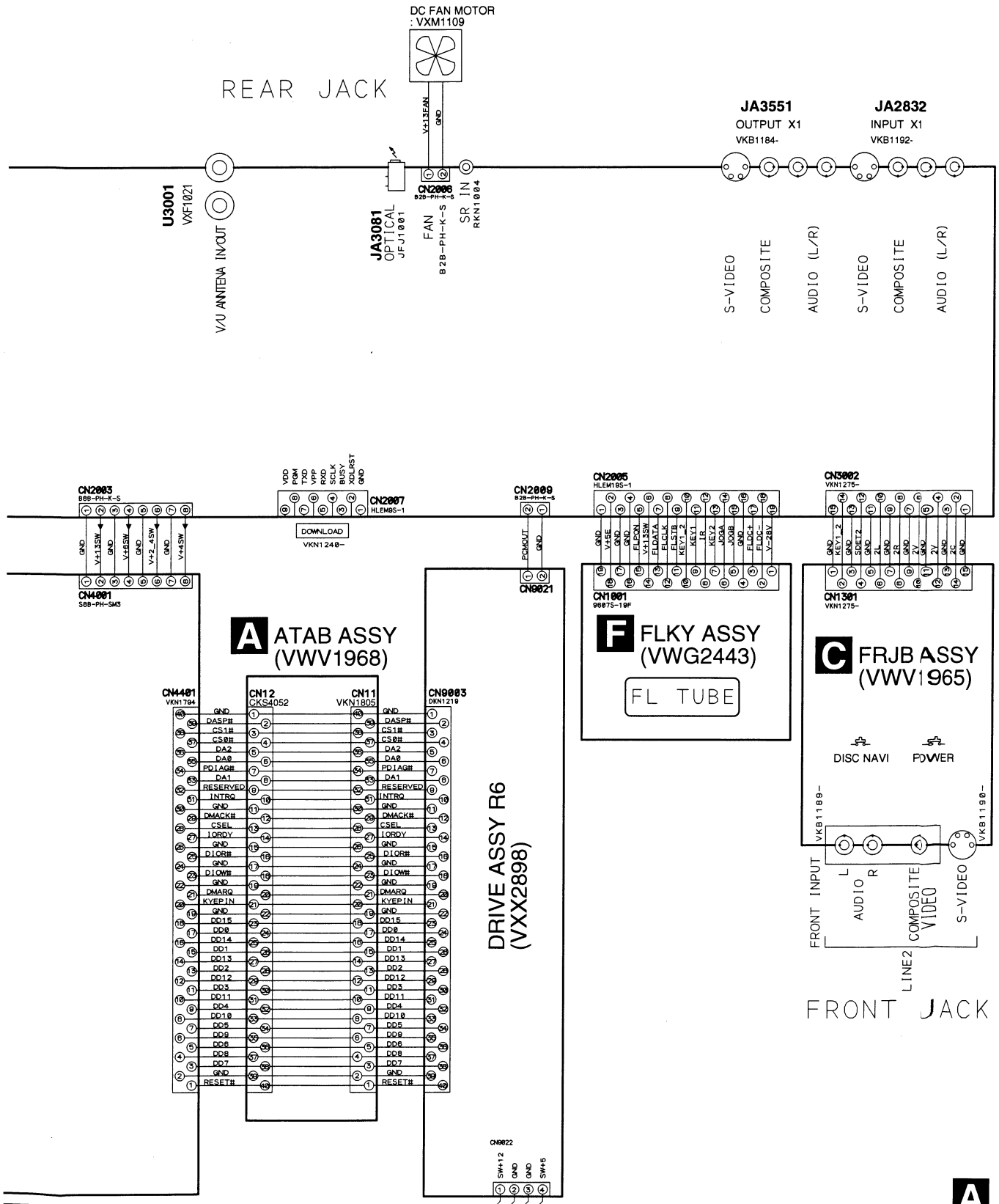
D

E

F



Note : When ordering service parts, be sure to refer to "EXPLODED VIEWS and PARTS LIST" or "PCB PARTS LIST".



C

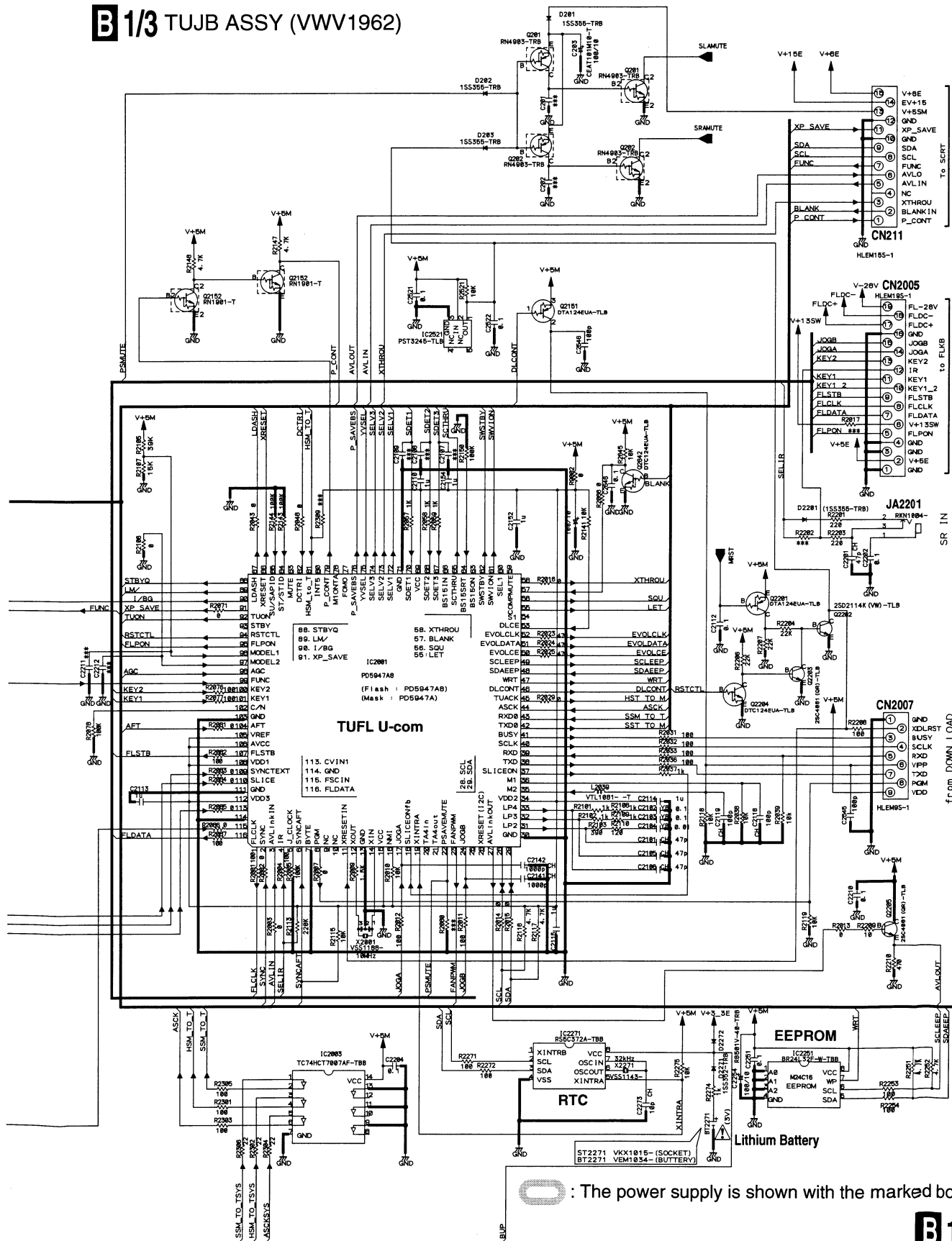


E



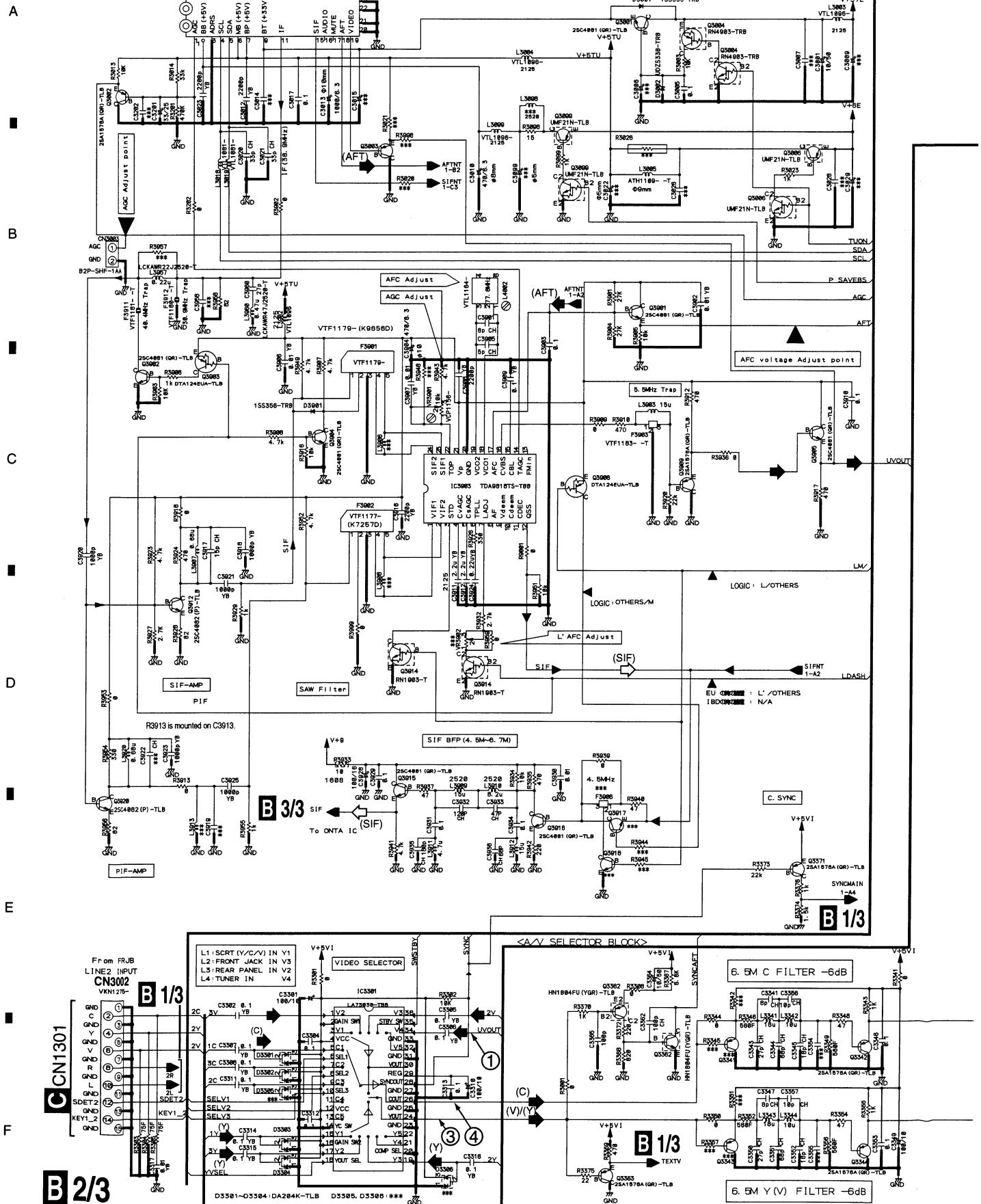
F

B 1/3 TUJB ASSY (VWV1962)

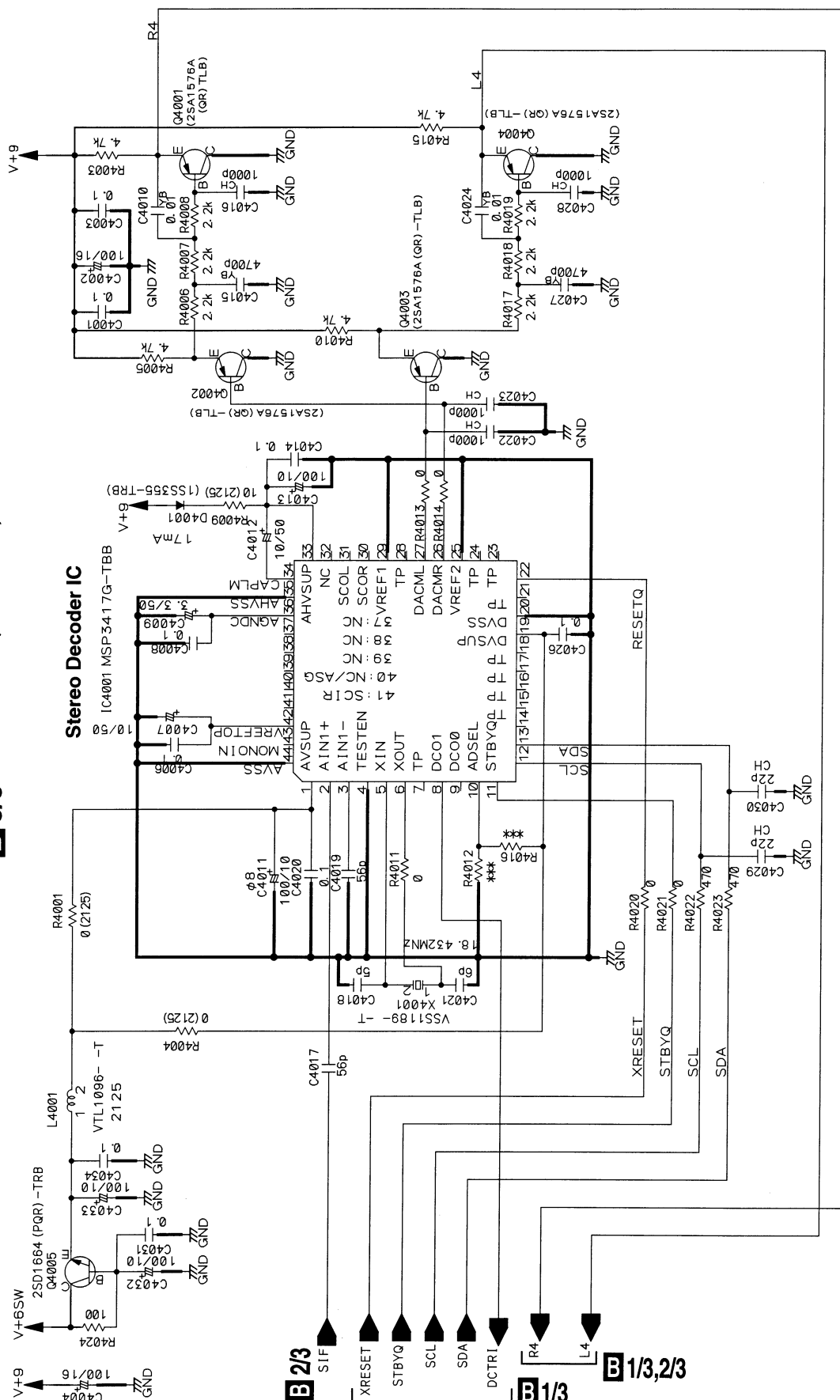


: The power supply is shown with the marked box.

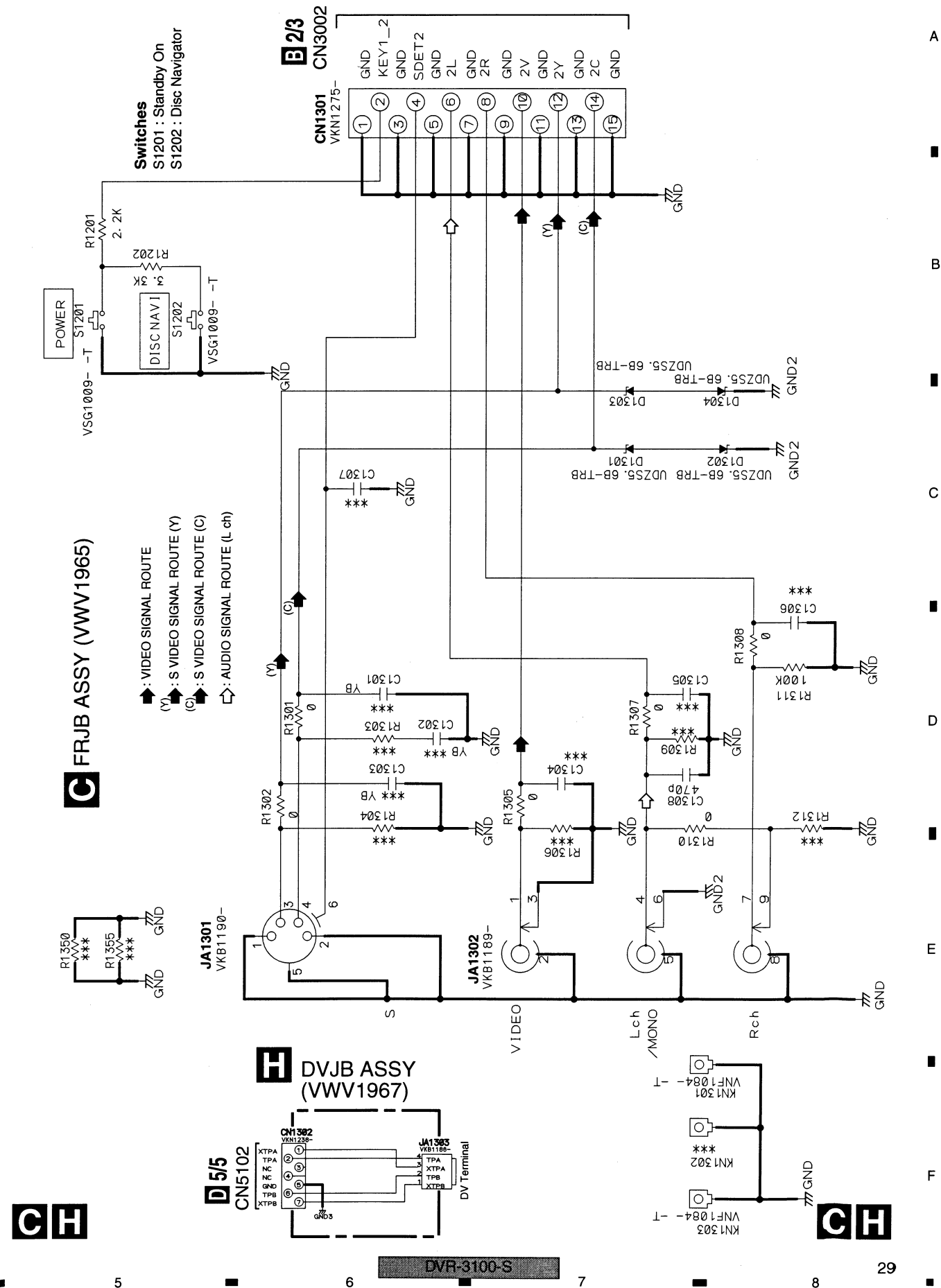
3.4 TUJB ASSY(2/3)







3.6 FRJB and DVJB ASSYS



3.7 MAIN ASSY(1/5)

A

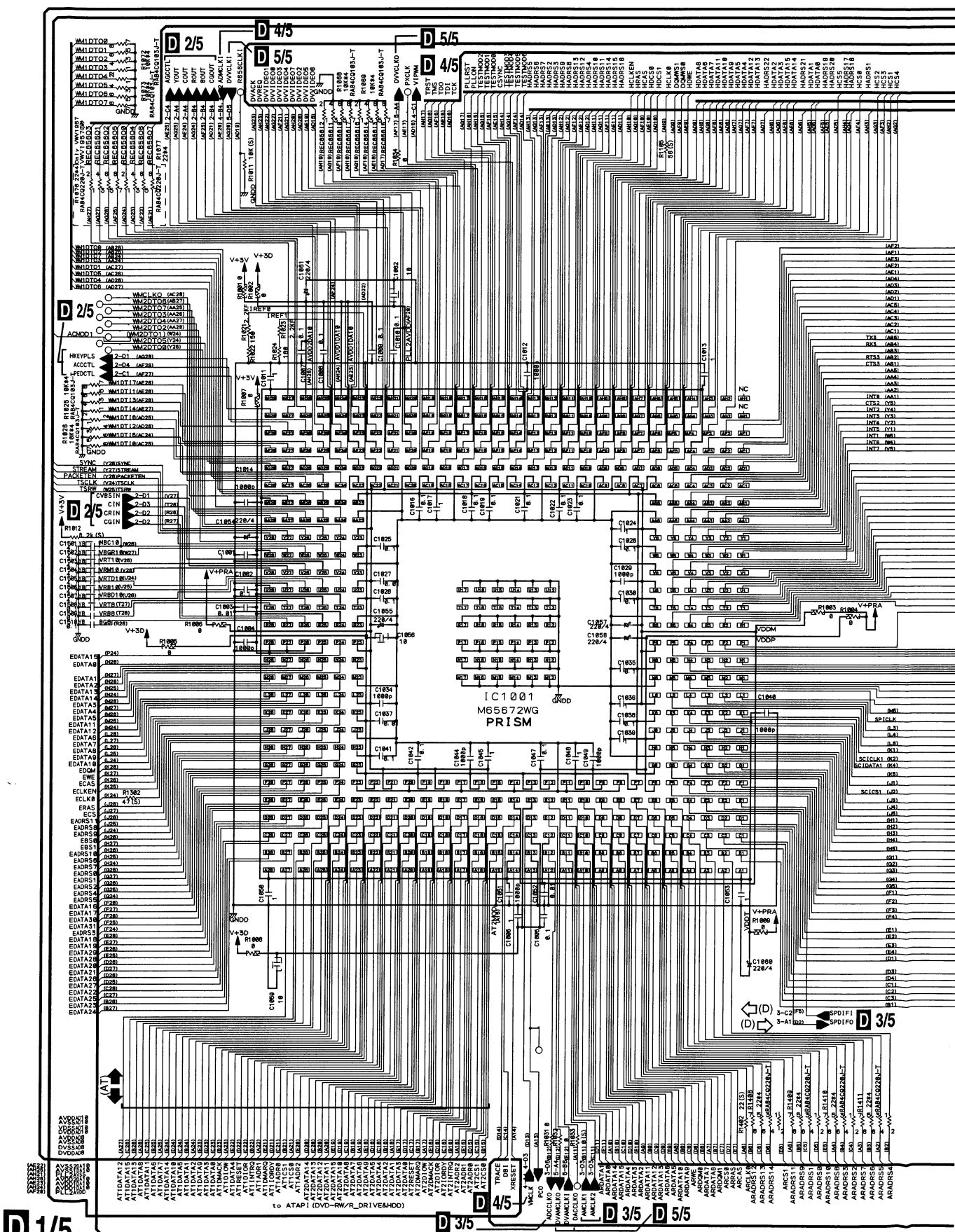
B

C

D

E

F





D 1/5

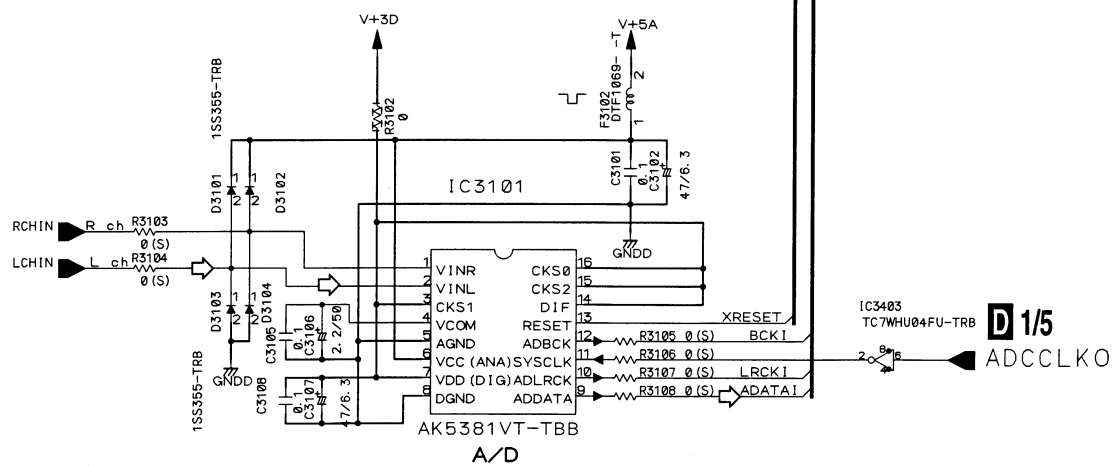
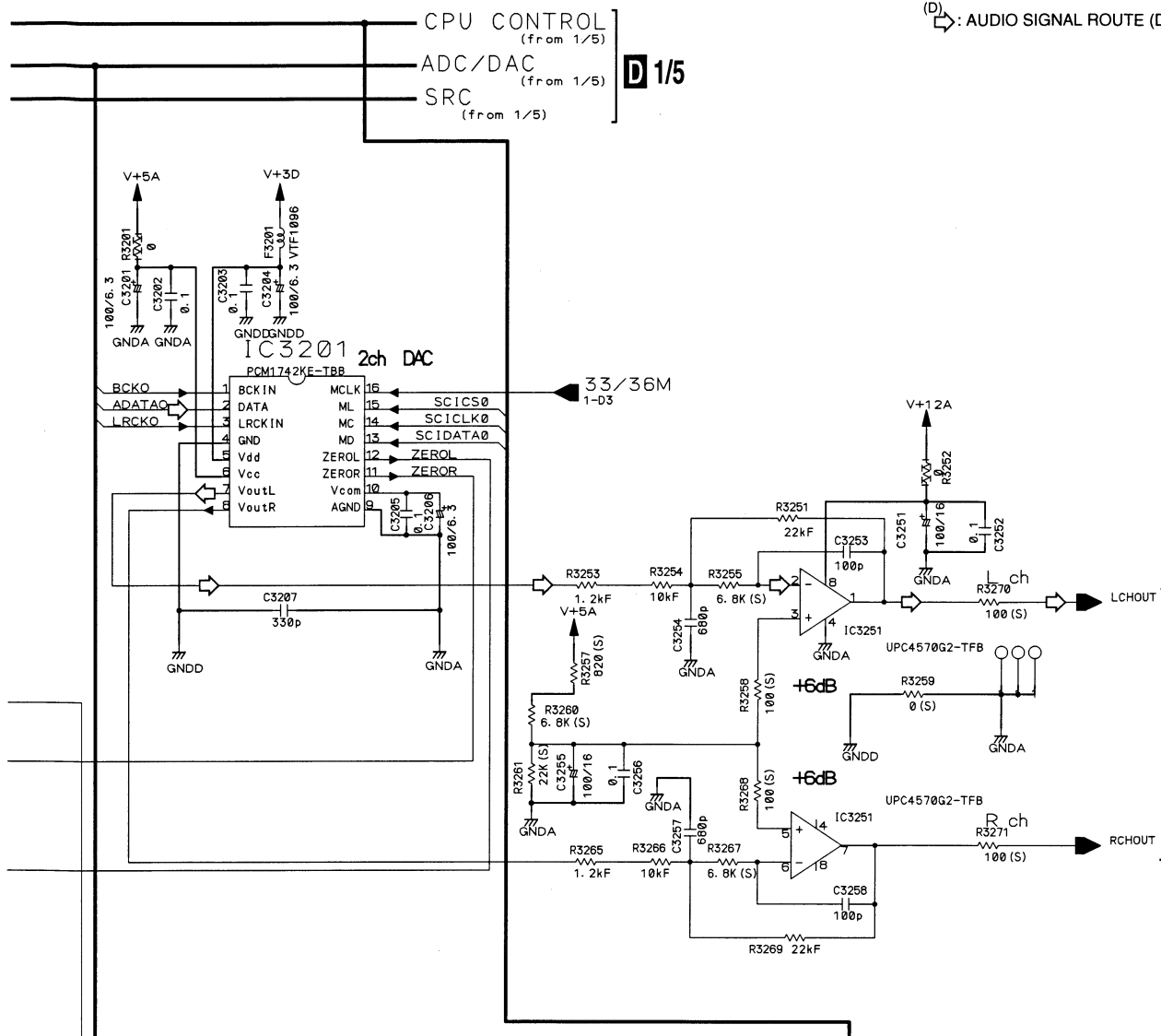
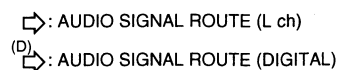
F.

32

D 3/5 MAIN ASSY (VWV1971)

A



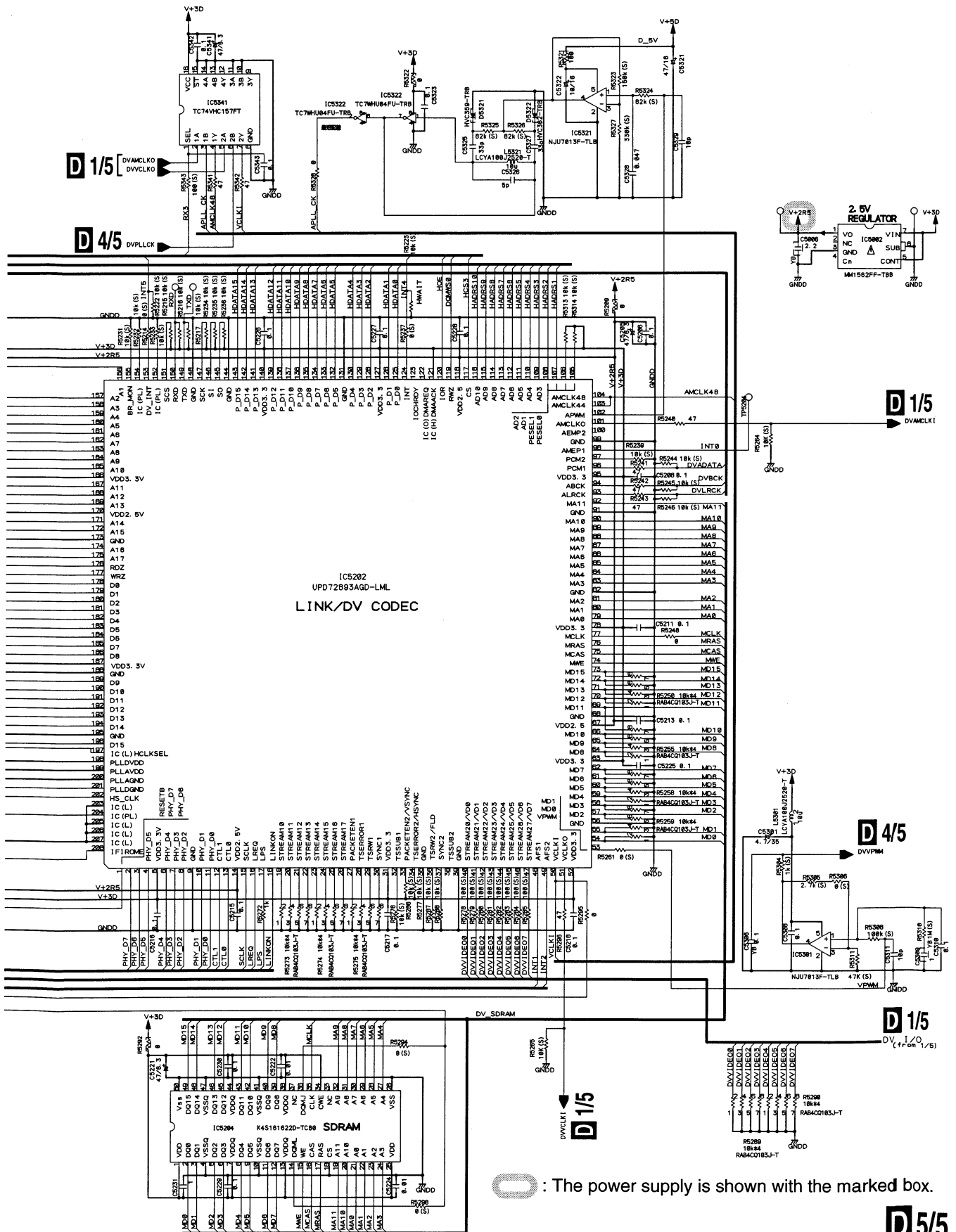


F



F





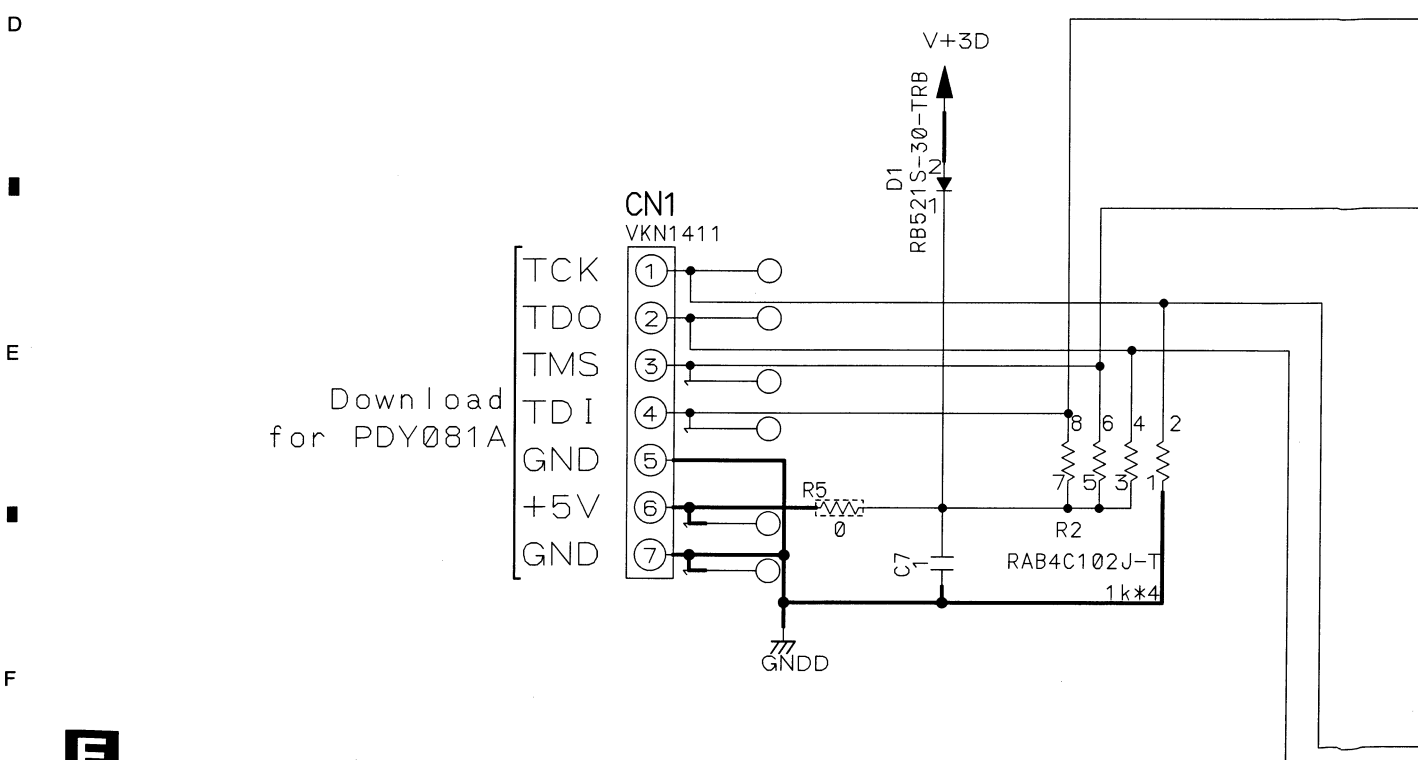
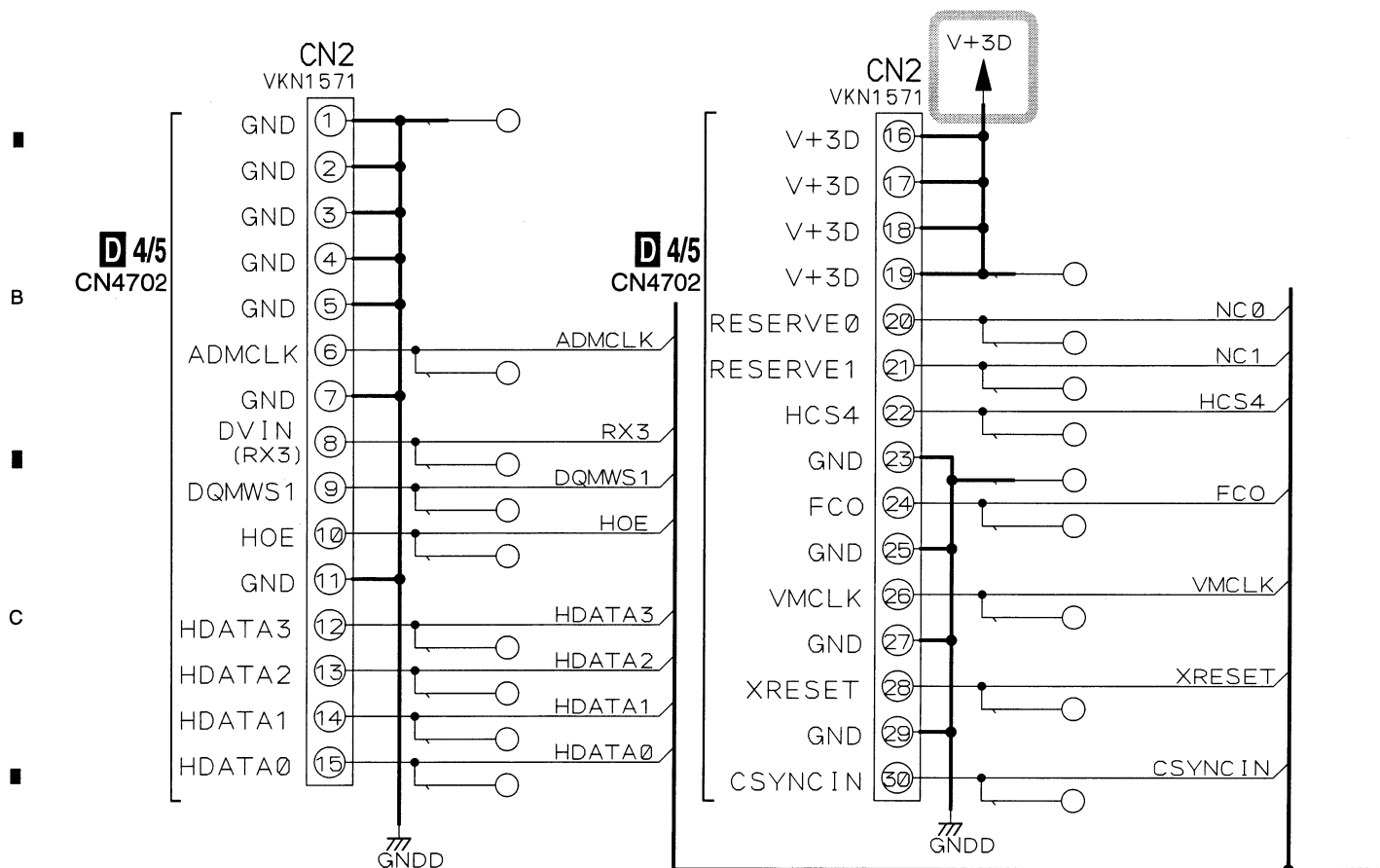
The power supply is shown with the marked box.

D 5/5

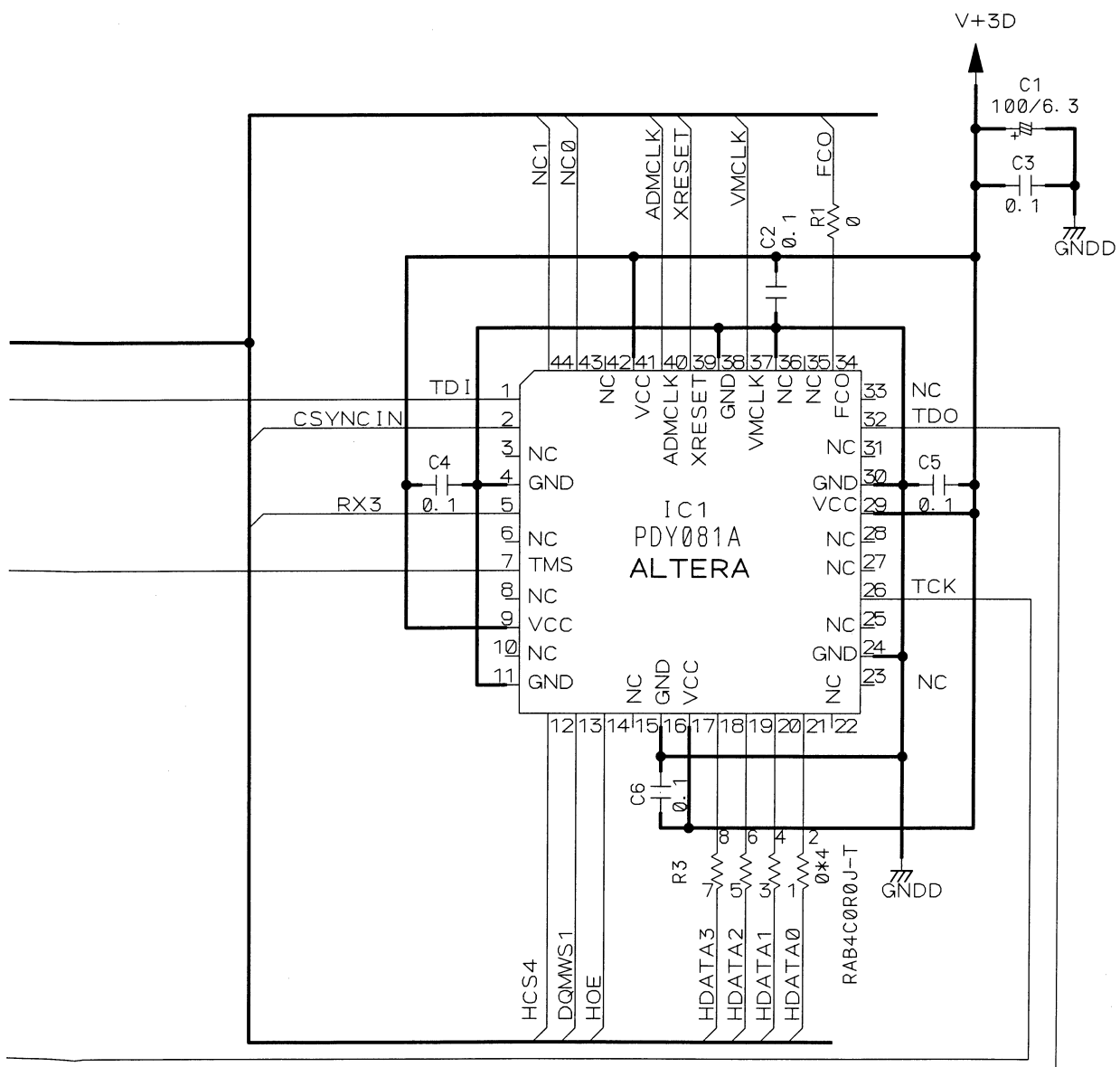
DVR-3100-S

3.12 MHLP ASSY

A **E** MHLP ASSY (VWV1991)



: The power supply is shown with the marked box.

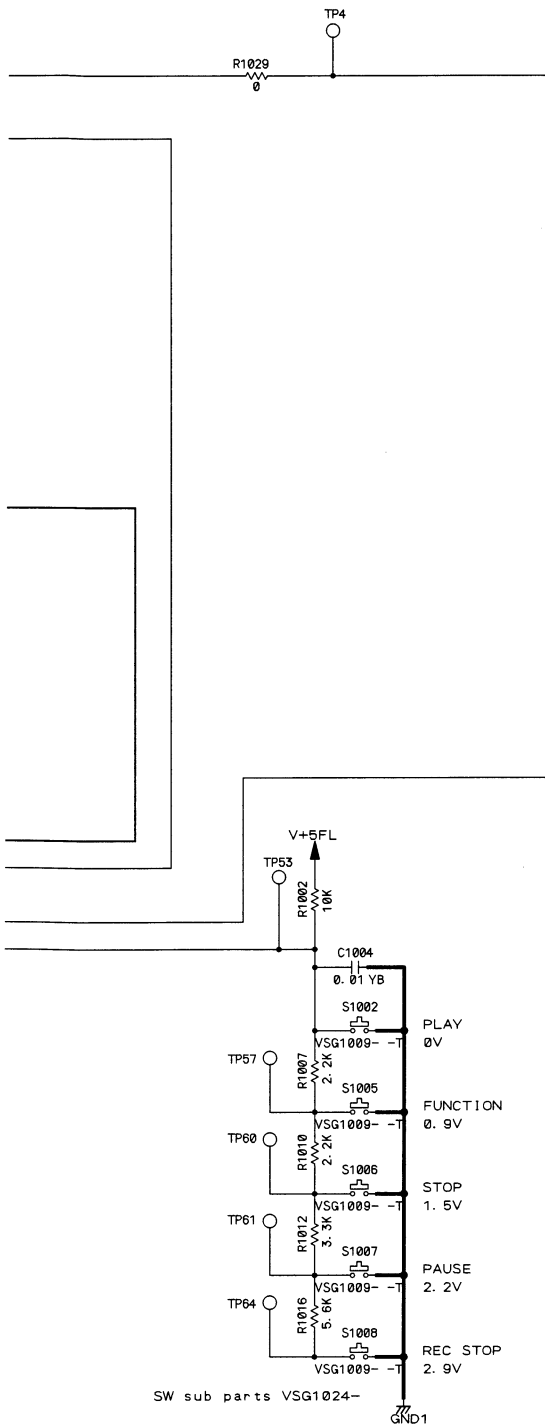


F

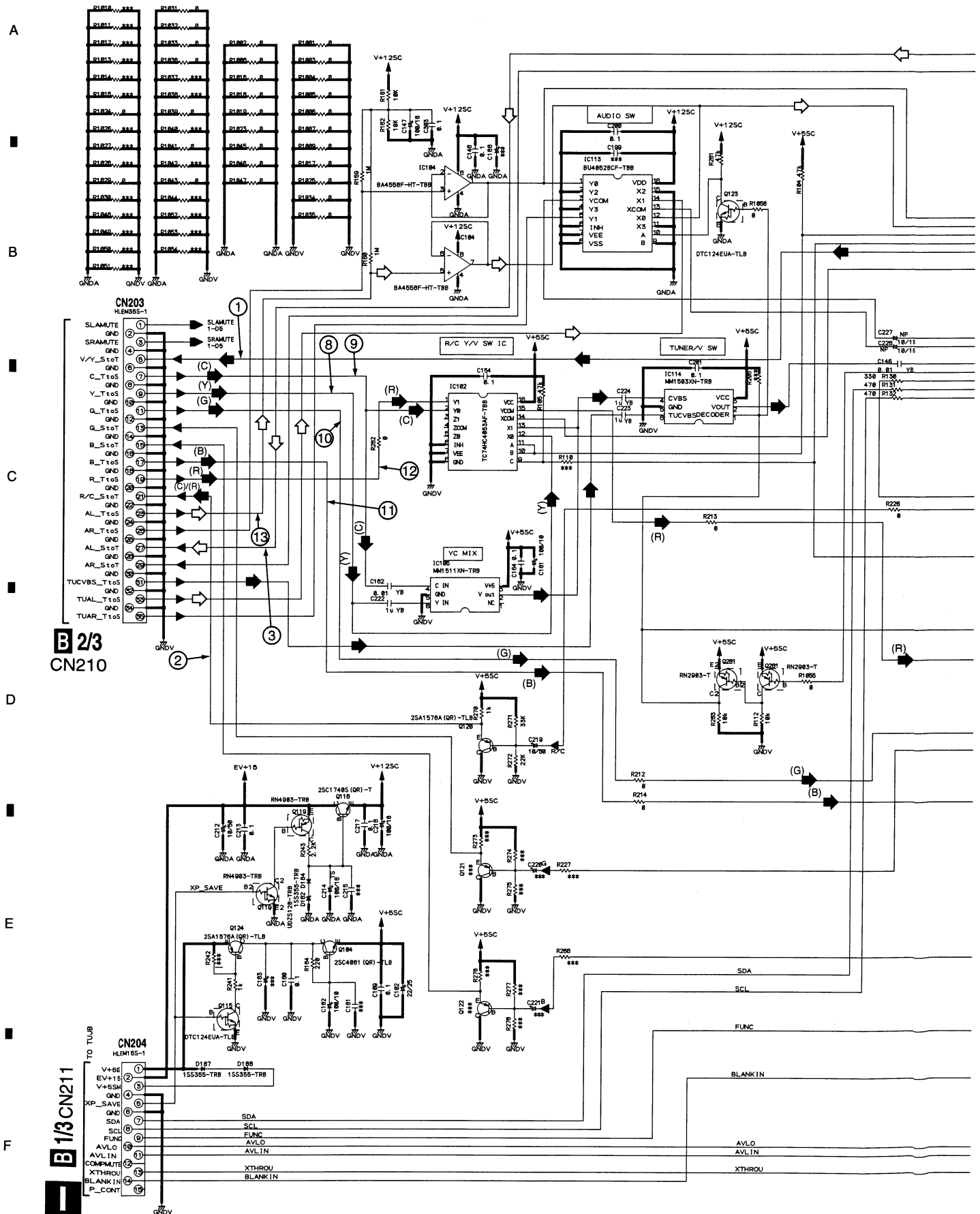
F FLKY ASSY (VWG2443)

Switches

S1001 : REC
 S1002 : PLAY
 S1003 : SMART JOG
 S1004 : OPEN/CLOSE
 S1005 : FUNCTION
 S1006 : STOP
 S1007 : PAUSE
 S1008 : REC STOP



3.14 SCRB ASSY

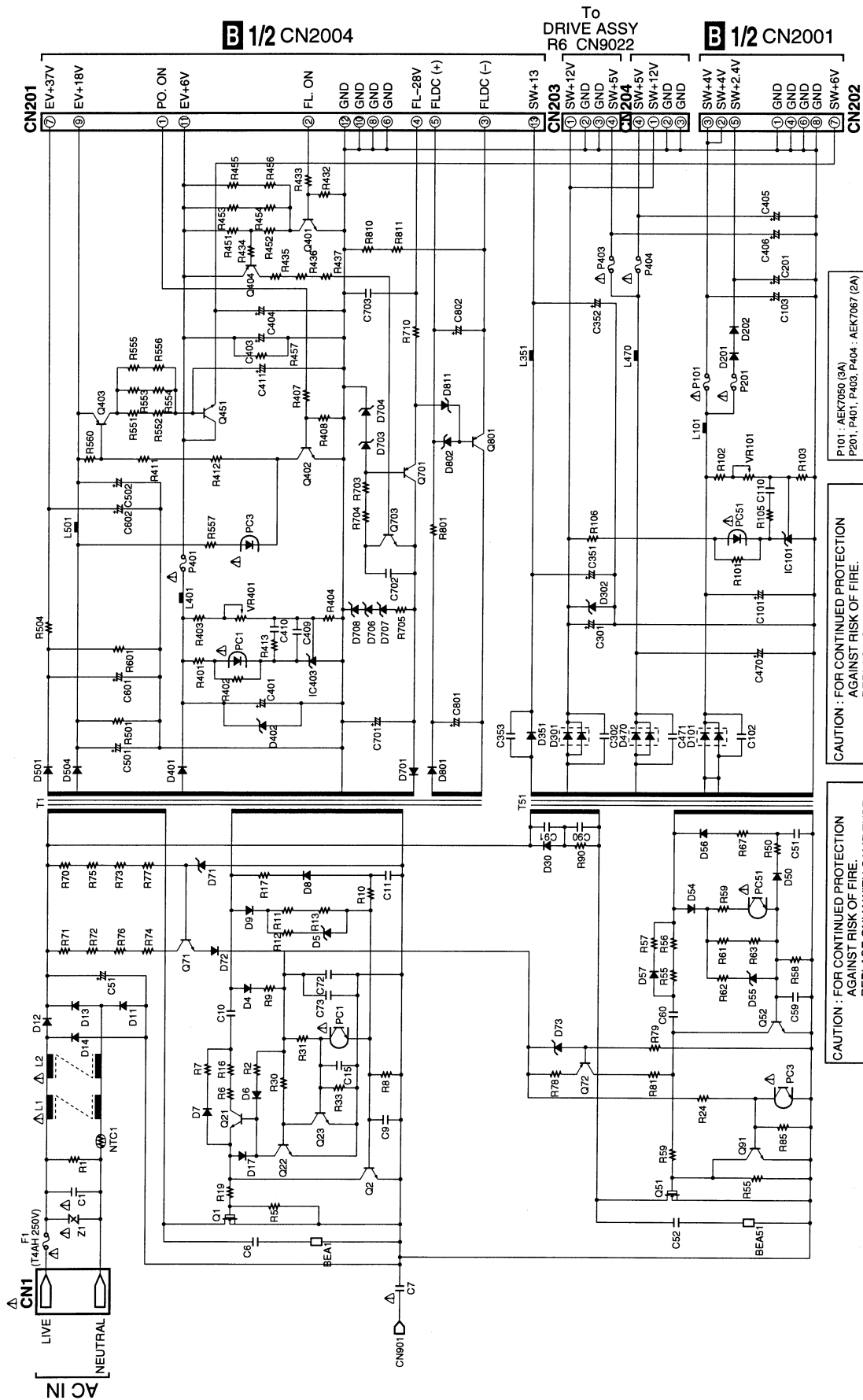


3.15 POWER SUPPLY UNIT

• NOTE FOR FUSE REPLACEMENT

CAUTION -FOR CONTINUED PROTECTION AGAINST RISK OF FIRE.
REPLACE WITH SAME TYPE AND RATINGS ONLY.

G POWER SUPPLY UNIT (VWR1374)



P101 : AEK7050 (3A)
P201, P401, P403, P404 : AEK7067 (2A)

CAUTION : FOR CONTINUED PROTECTION
AGAINST RISK OF FIRE.
REPLACE ONLY WITH SAME TYPE
NO. 491003 FOR P101 MFD, BY
LITTELFUSE INC.

CAUTION : FOR CONTINUED PROTECTION
AGAINST RISK OF FIRE.
REPLACE ONLY WITH SAME TYPE
NO. 491002 FOR P201, P401, P403
and P404 MFD, BY LITTELFUSE INC.

3.16 WAVE FORMS

Note : The encircled numbers denote measuring point in the schematic diagram.

B TUJB ASSY

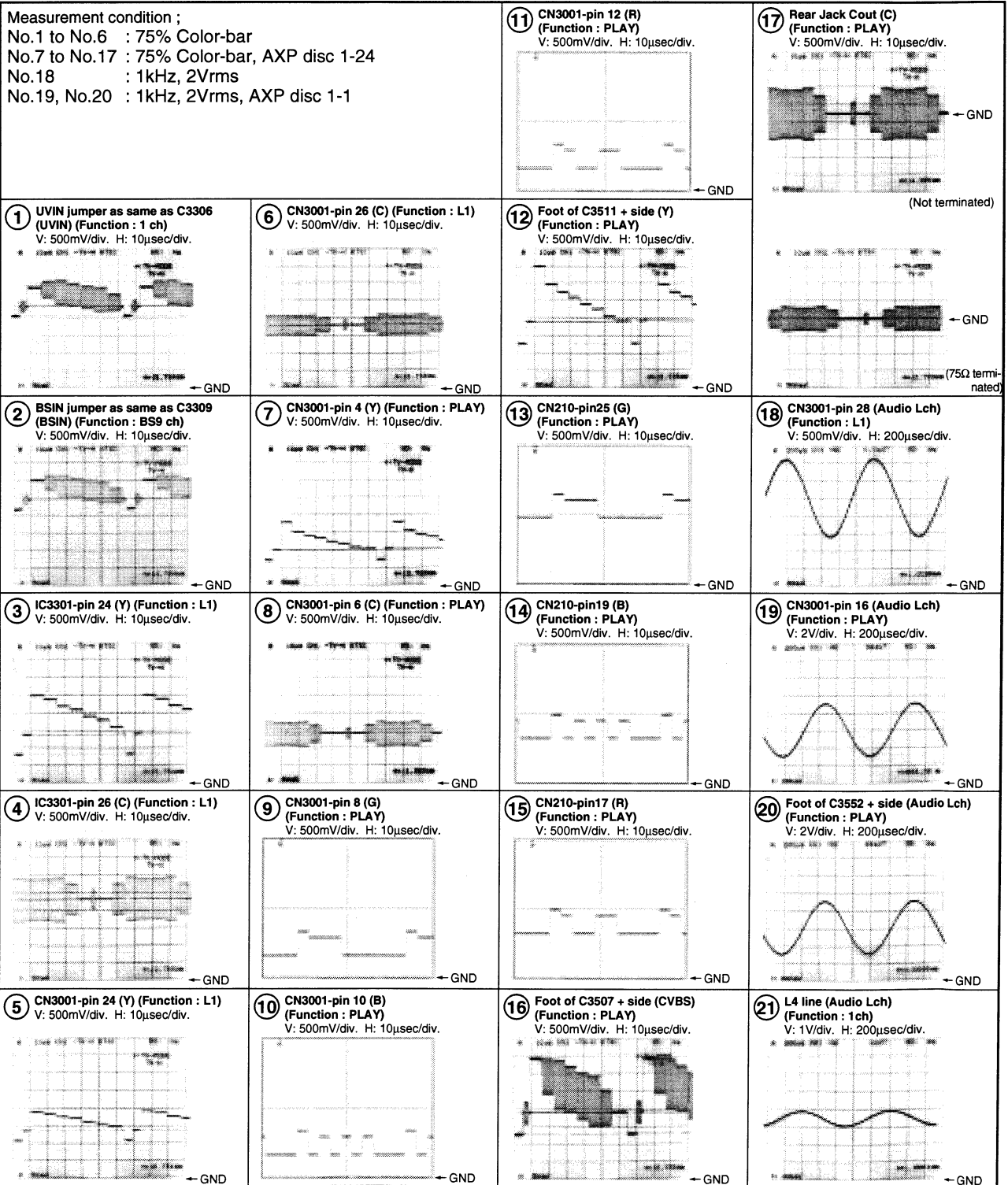
Measurement condition ;

No.1 to No.6 : 75% Color-bar

No.7 to No.17 : 75% Color-bar, AXP disc 1-24

No.18 : 1kHz, 2Vrms

No.19, No.20 : 1kHz, 2Vrms, AXP disc 1-1



D MAIN ASSY

- A Measurement condition ;
 No.3 to No.8, No.10 to No.13 : 75% Color-bar, AXP disc 1-24
 No.15 ,No.16 : 75% Color-bar
 No.9, No.14 : 1kHz, 2Vrms, AXP disc 1-1
 No.17 : 1kHz, 2Vrms

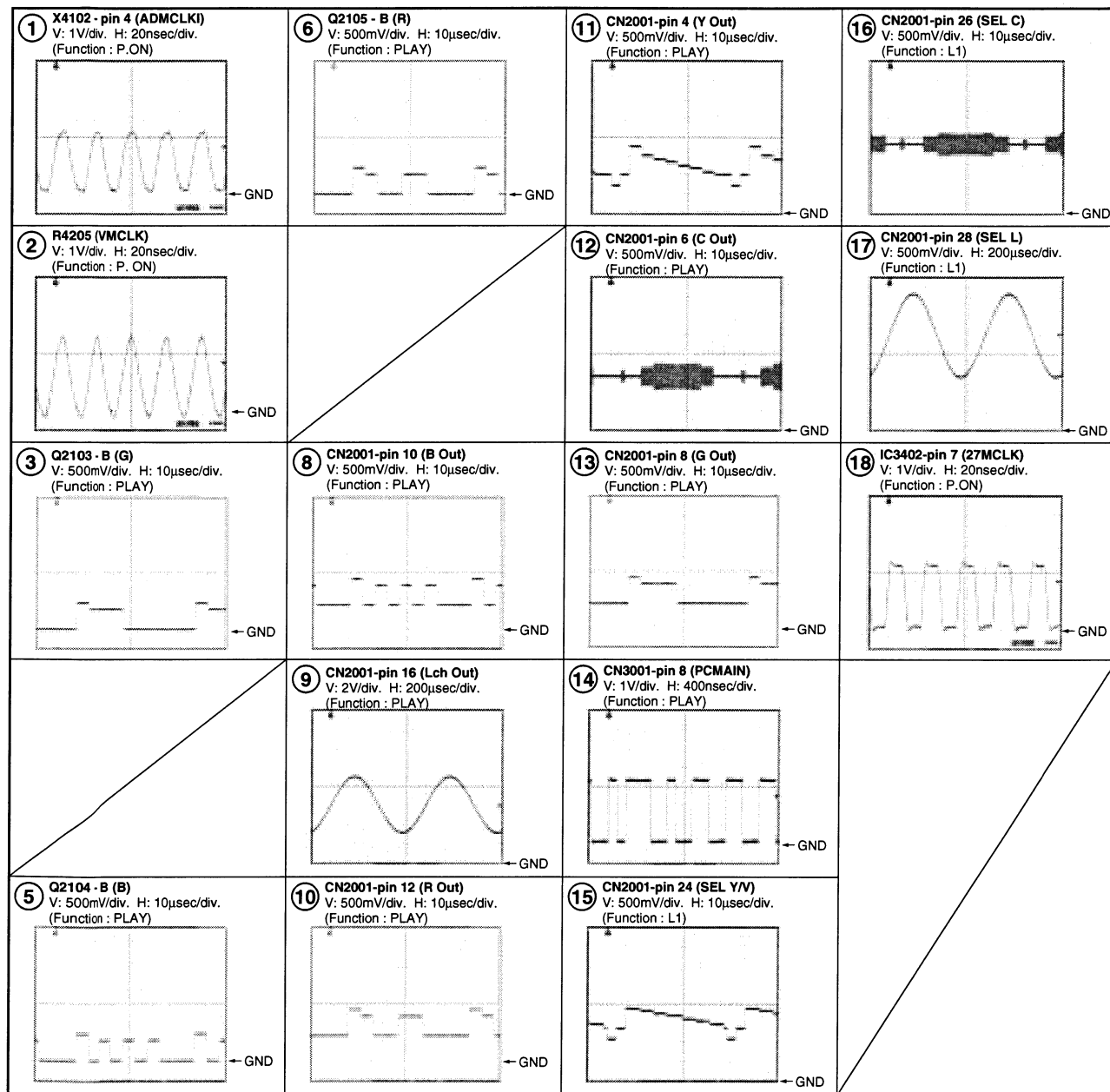
B

C

D

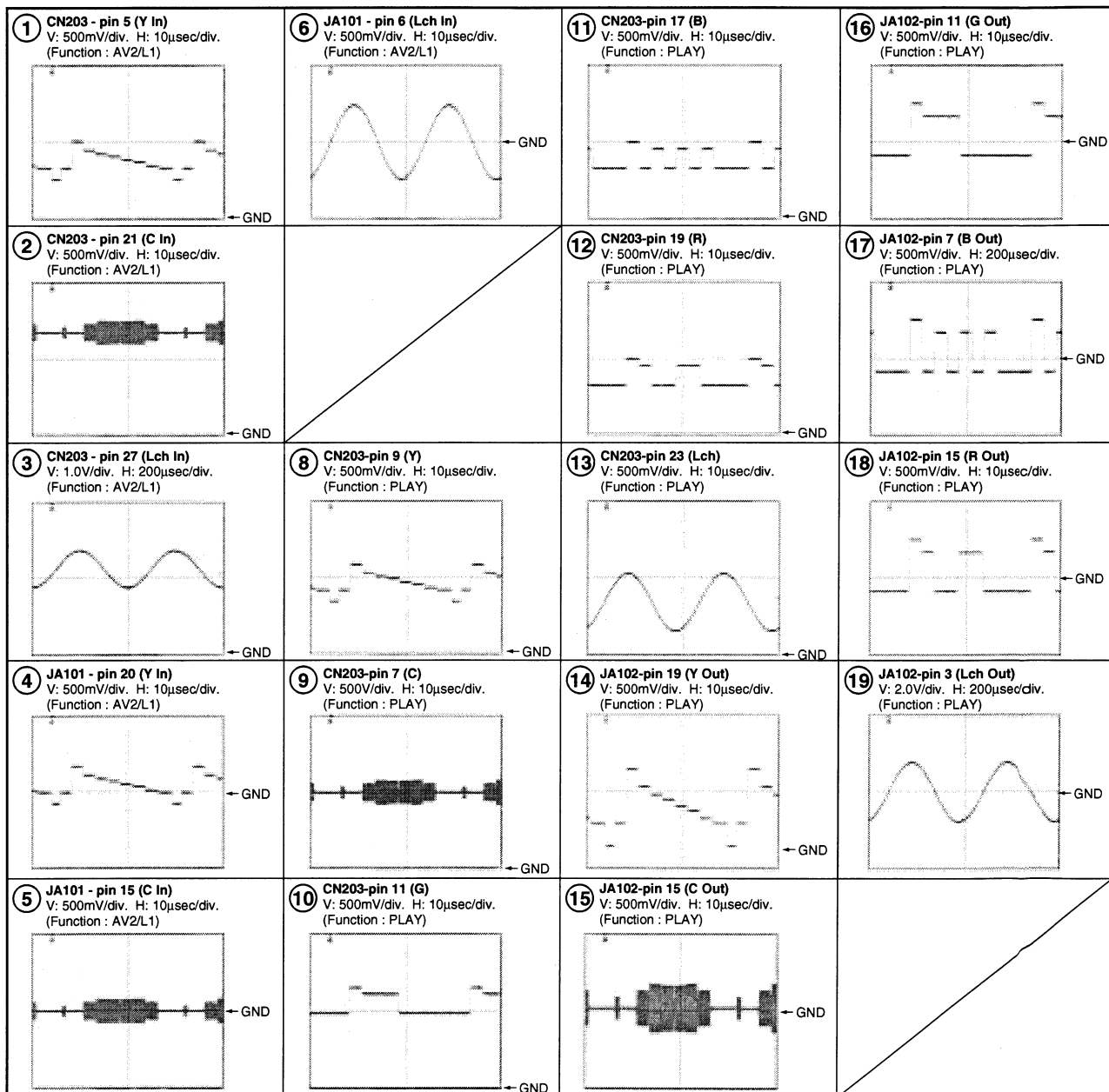
E

F



I SCRB ASSY

Measurement condition ;
 No.8 to No.12, No.14 to No.18 : 75% Color-bar, AXP disc 1-24
 No.1, No.2, No.4, No.5 : 75% Color-bar
 No.13, No.19 : 1kHz, 2Vrms, AXP disc 1-1
 No.3, No.6 : 1kHz, 2Vrms



4. PCB CONNECTION DIAGRAM

4.1 ATAB ASSY

A

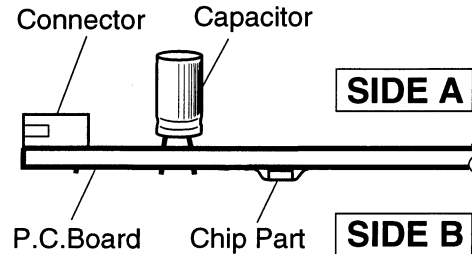
NOTE FOR PCB DIAGRAMS :

1. Part numbers in PCB diagrams match those in the schematic diagrams.
2. A comparison between the main parts of PCB and schematic diagrams is shown below.

| Symbol In PCB Diagrams | Symbol In Schematic Diagrams | Part Name |
|------------------------|------------------------------|--------------------------|
| | | Transistor |
| | | Transistor with resistor |
| | | Field effect transistor |
| | | Resistor array |
| | | 3-terminal regulator |

B

3. The parts mounted on this PCB include all necessary parts for several destinations.
- For further information for respective destinations, be sure to check with the schematic diagram.
4. View point of PCB diagrams.



C

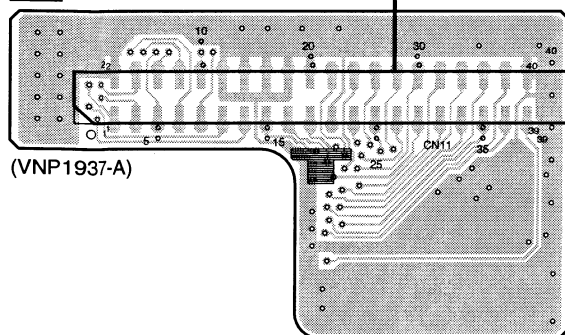
SIDE A

SIDE B

D

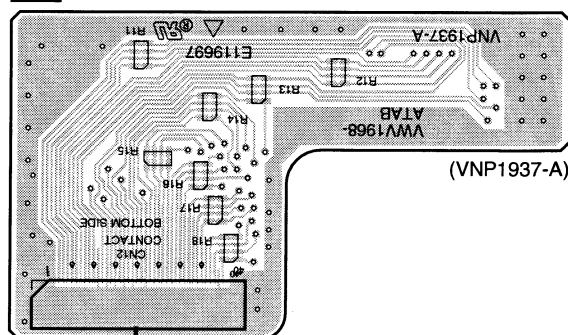
To DRIVE ASSY R6
CN9003

A ATAB ASSY



(VNP1937-A)

A ATAB ASSY



(VNP1937-A)

CN12

D CN4401

F

A

50

A

■

5

■

6

■

7

■

8

■

A

■

B

■

C

■

D

■

E

■

F

■

5

■

6

■

7

■

8

51

■

DVR-3100-S

4.2 TUMJ ASSY

SIDE A

B TUJB ASSY

DOWN LOAD

CN204

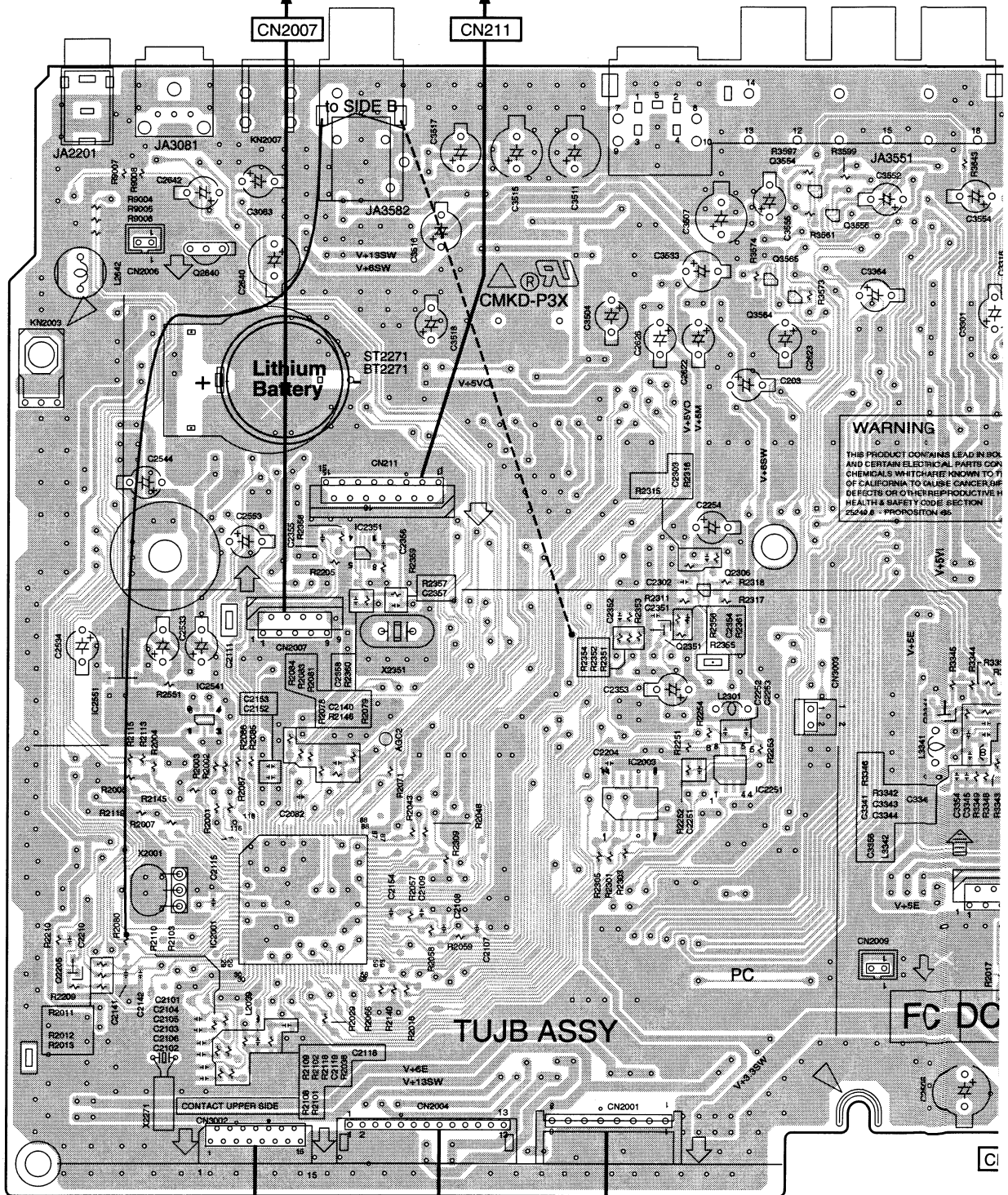
Q3554
Q3906

Q3556

Q3565
Q2640Q3564
Q3913IC2351
Q3004
Q3916
Q3099Q4002
Q2306
Q3006
Q3915
Q4001
Q2351
Q4004
Q3343IC2541
IC2551
IC4001
Q3404
Q3341
Q4003
IC2003Q3344
IC2251
Q3451
Q3407
Q3342IC2581
Q3452

IC2001

Q2205



WARNING

THIS PRODUCT CONTAINS LEAD IN SOLDER AND CERTAIN ELECTRICAL PARTS CONTAIN CHEMICALS KNOWN TO CAUSE CANCER OR DEFECTS OR OTHER REPRODUCTIVE HAZARDS. SEE SECTION 25440.6 - PROPOSITION 65.

FC DC

C CN1301

G CN201

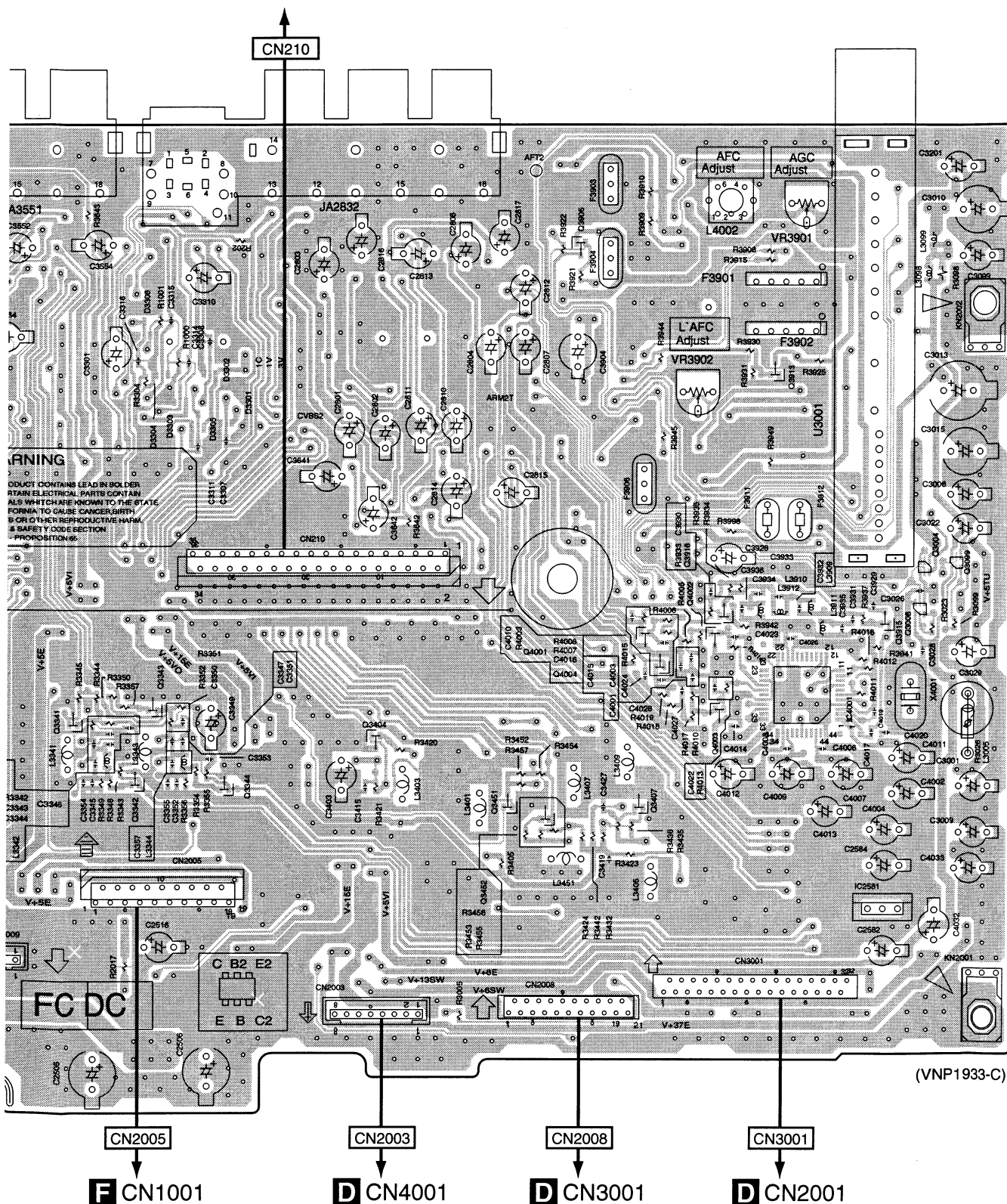
G CN202

B

SIDE A

I CN203

CN210



F CN1001

D CN4001

D CN3001

D CN2001

(VNP1933-C)

B

SIDE B

B TUJB ASSY

CN210

Q3909
Q3002 Q3901Q3908
Q3904
Q3559 Q3562
IC3081Q3911 Q3905
IC3903
Q2621 IC2801
Q3363 Q2641
Q3363 IC3301
Q3362 Q3561
Q3914
Q3912
Q3920 IC3501
Q3001
Q3371 Q3551
Q2204
Q202 Q201
Q3918
Q3917 Q2201Q2203
Q3903 Q2202
Q3902

Q3003

Q3408 Q3402

Q3410
IC2521Q2532
Q3409 Q2305

Q2151

Q2531

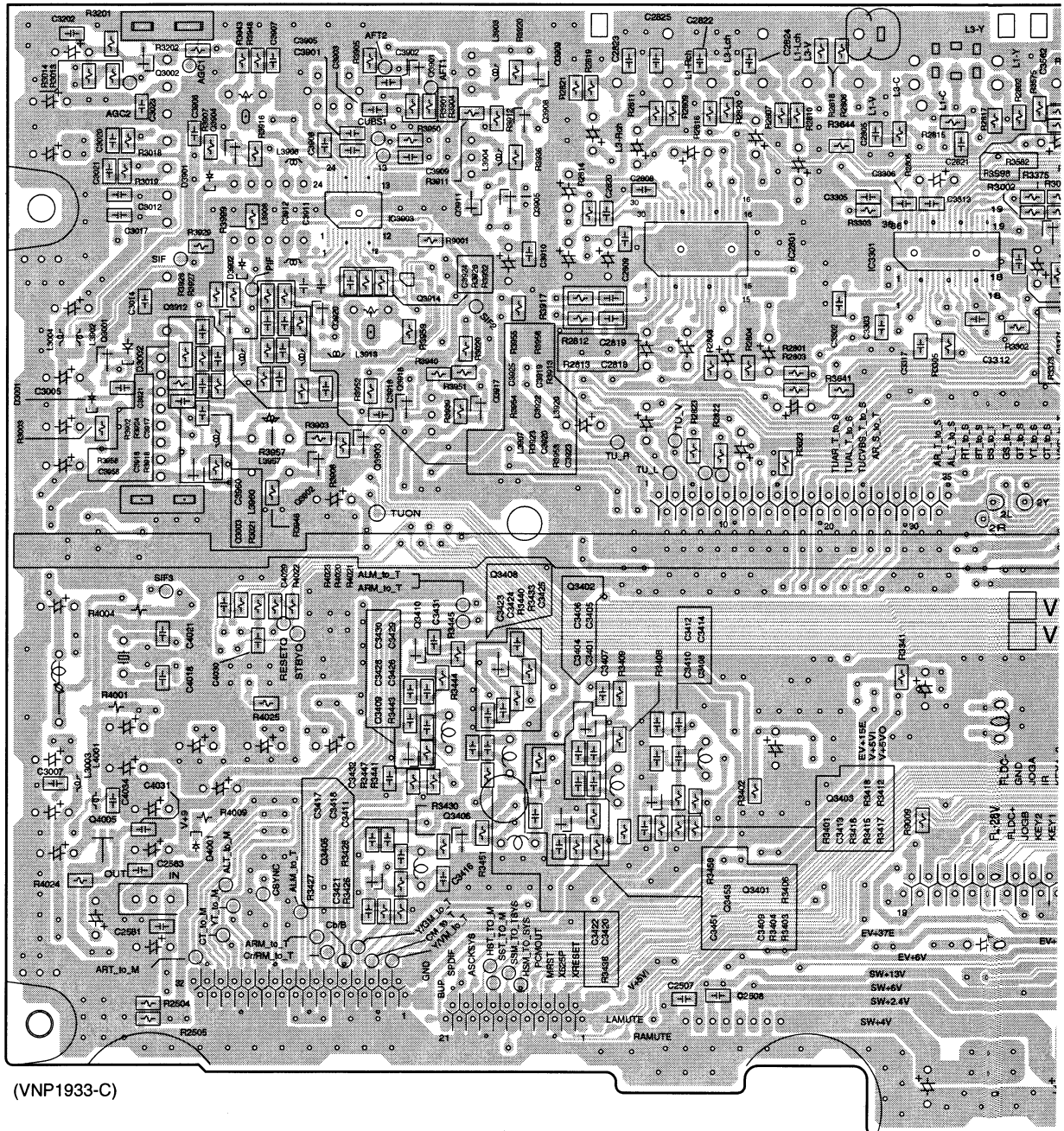
Q3403
Q3406
Q4005
Q2642 Q2152

Q3405

Q3401
Q3453

E

IC2271



(VNP1933-C)

CN3001

CN2008

CN2003

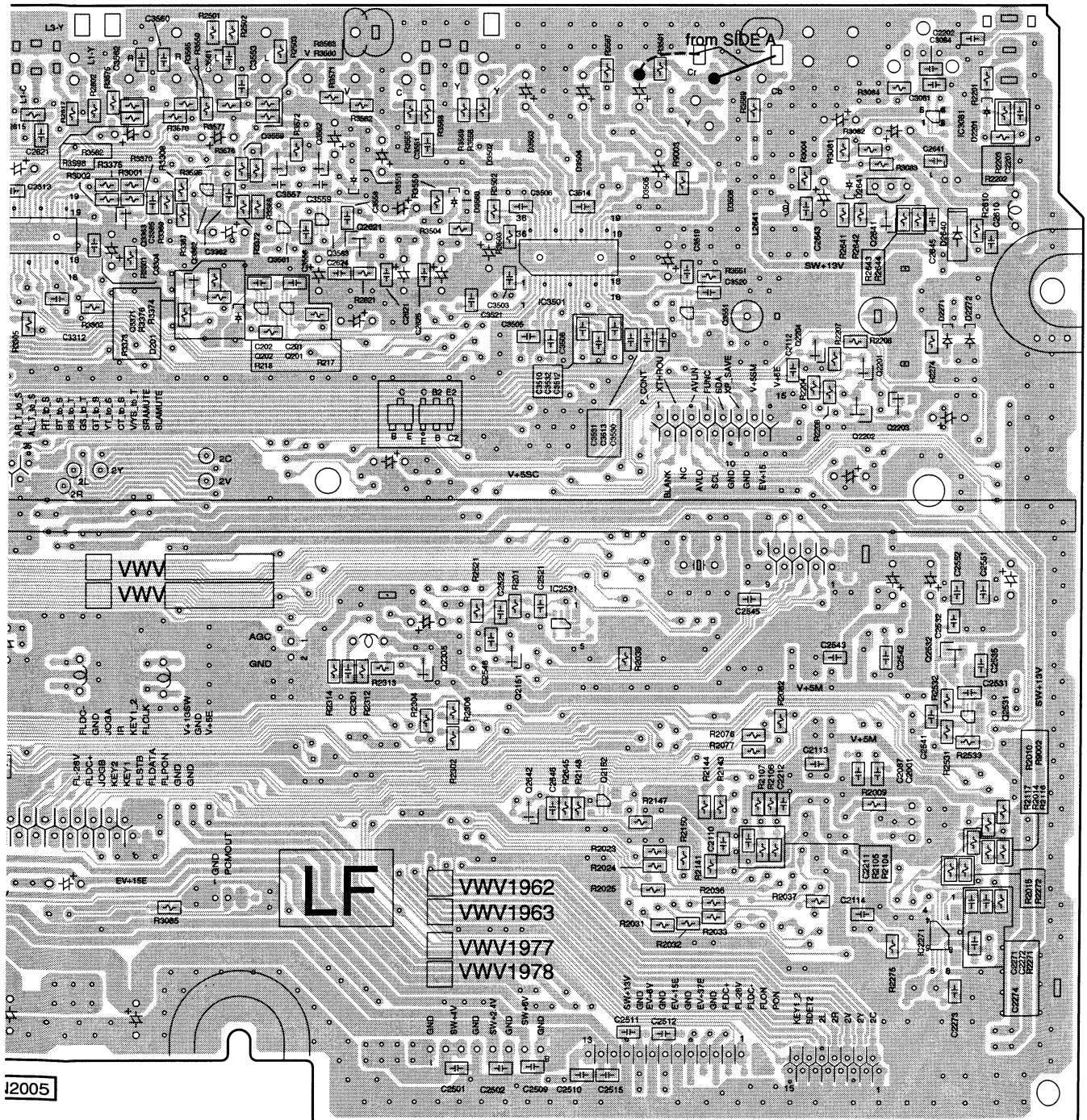
CN2005

B

SIDE B

CN211

CN2007



CN2001

CN2004

CN3002

J2005

DVR-3100-S

4.3 MAIN and MHLP ASYS

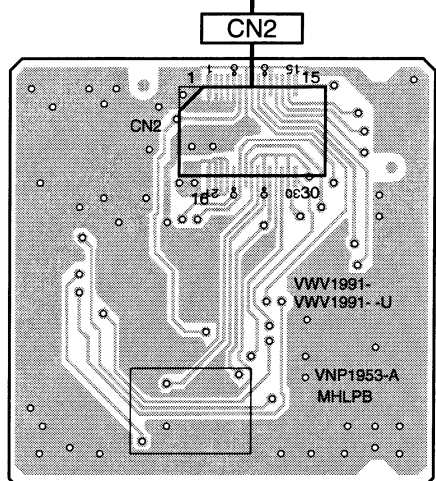
SIDE A

| | | | | |
|--------|--------|--------|-------|--------|
| Q1102 | IC4101 | IC4007 | Q2105 | Q2104 |
| Q2311 | | | Q2101 | Q2102 |
| Q2312 | Q2222 | | | Q2103 |
| IC2301 | IC2331 | Q2403 | Q2402 | IC4206 |
| | | VR2104 | | VR1001 |
| | | VR2105 | | VR1002 |

D MAIN ASSY

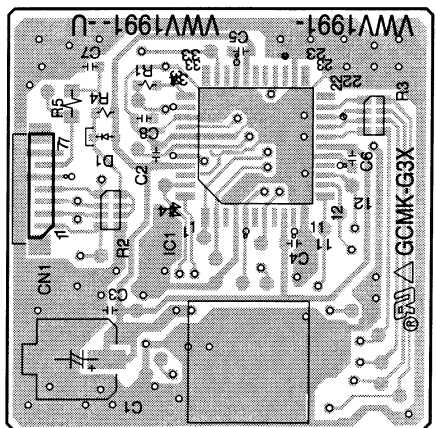
E MHLP ASSY

SIDE B

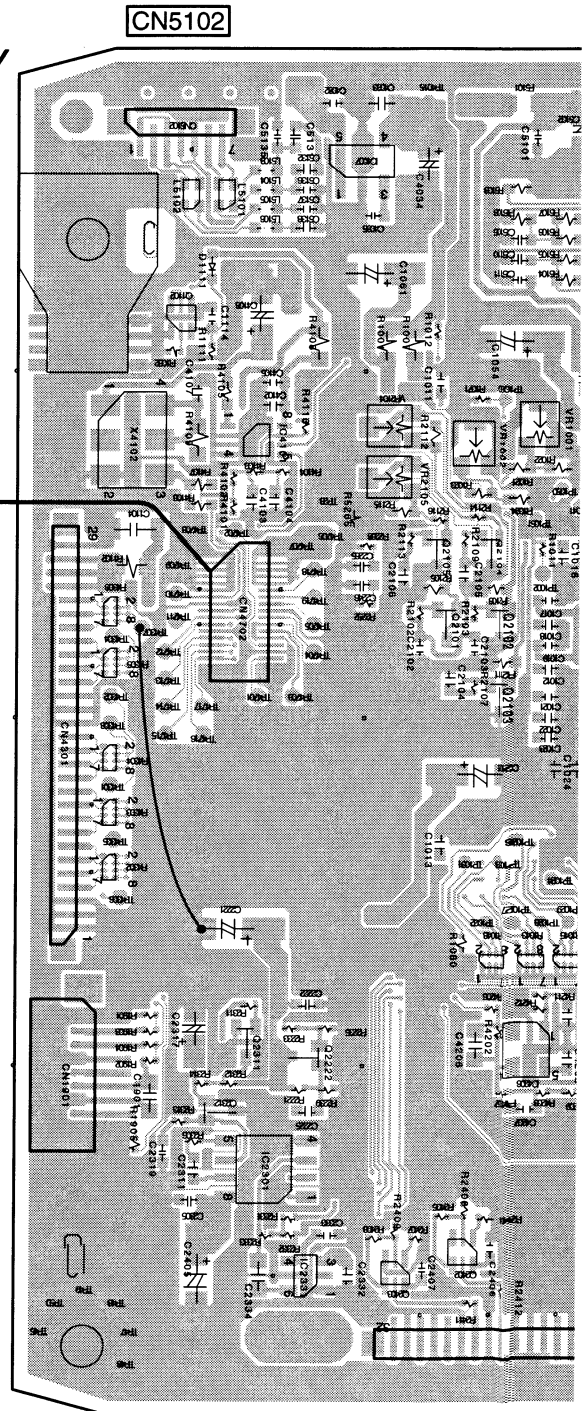


(VNP1953-A)

SIDE A



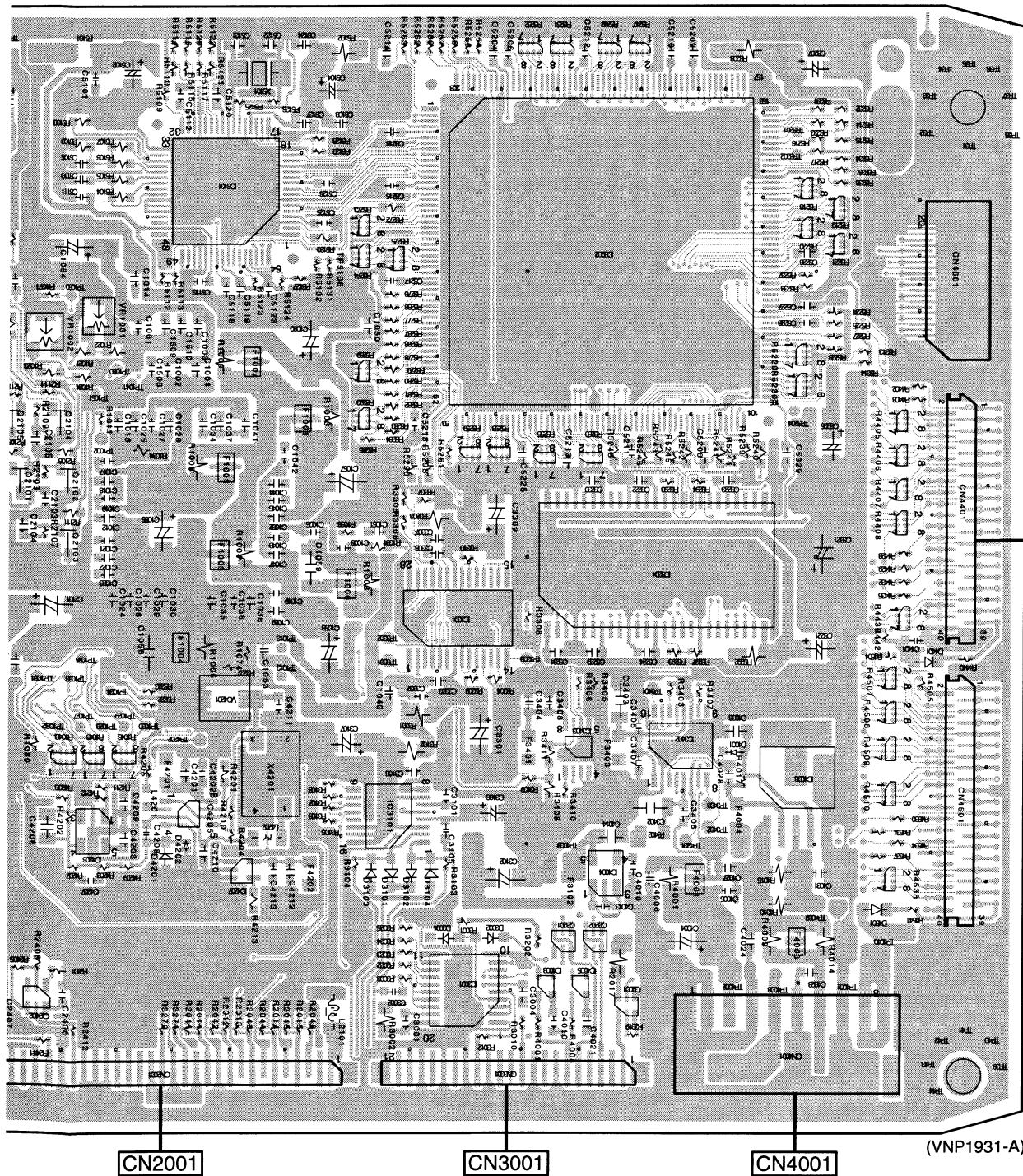
(VNP1953-A)



SIDE A

| | | | | | | |
|----|--------|--------|--------|--------|--------|--------|
| 15 | Q2104 | IC5101 | IC3301 | IC5202 | | |
| 1 | Q2102 | | | IC3403 | IC4004 | IC5204 |
| | Q2103 | | | | Q3202 | IC3402 |
| | IC4206 | IC4205 | IC3101 | Q3201 | IC4005 | |
| | Q2402 | IC4207 | IC3001 | IC4003 | Q2001 | IC4008 |
| | VR1001 | | | | | |
| | VR1002 | VC4201 | | | | |

This PCB is six layer structure.

**B** CN3001**B** CN2008**B** CN2003**D**

DVR-3100-S

SIDE B

A

| | | | | | |
|--------|--------|--------|--------|--------|--------|
| | | IC5203 | | IC1301 | |
| IC5301 | IC5341 | IC5341 | IC1421 | | |
| IC5321 | IC5002 | IC5002 | IC1401 | IC3201 | IC1001 |
| IC4006 | IC4001 | IC4002 | IC3002 | IC3251 | IC1201 |

D MAIN ASSY

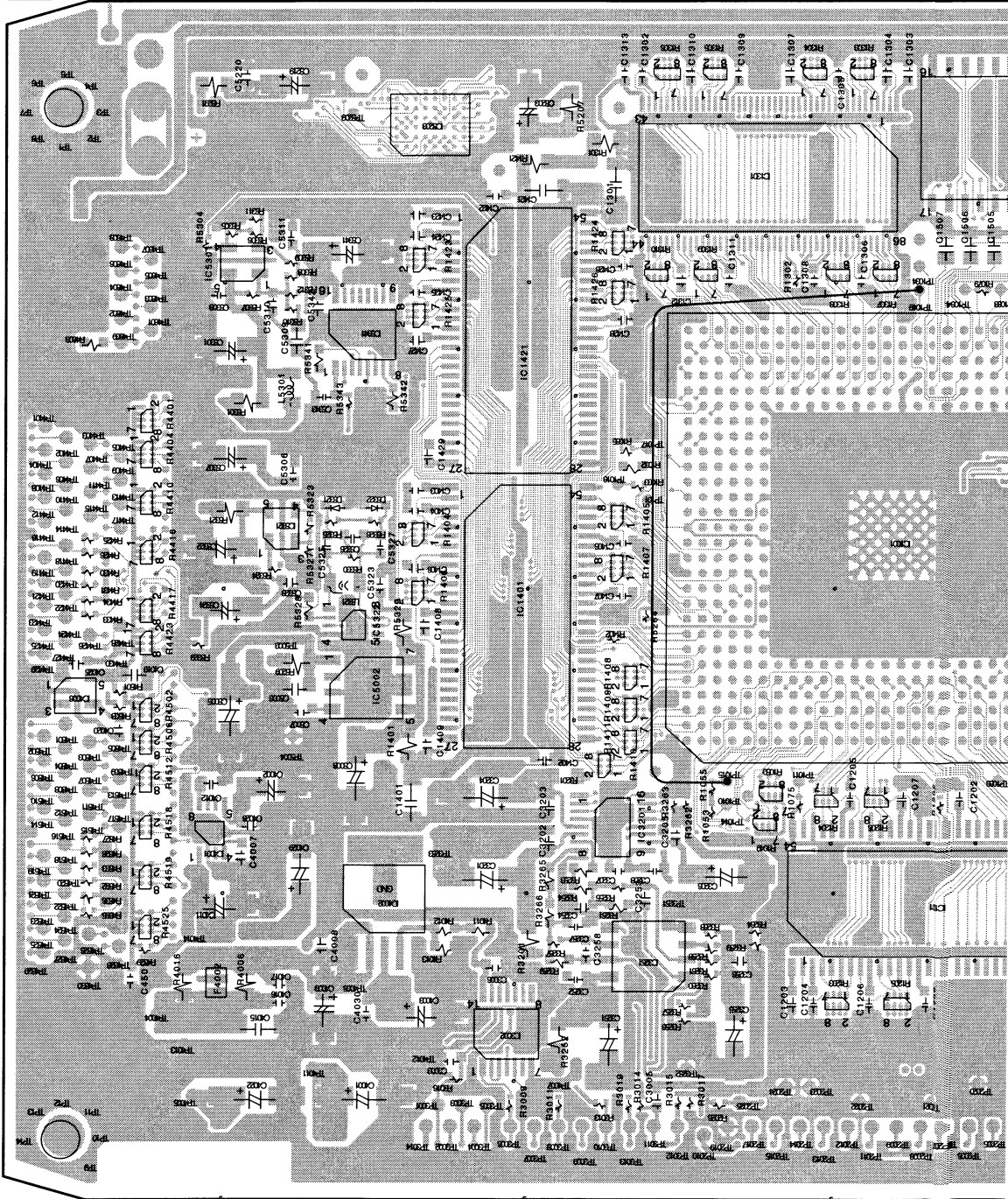
B

C

D

E

F



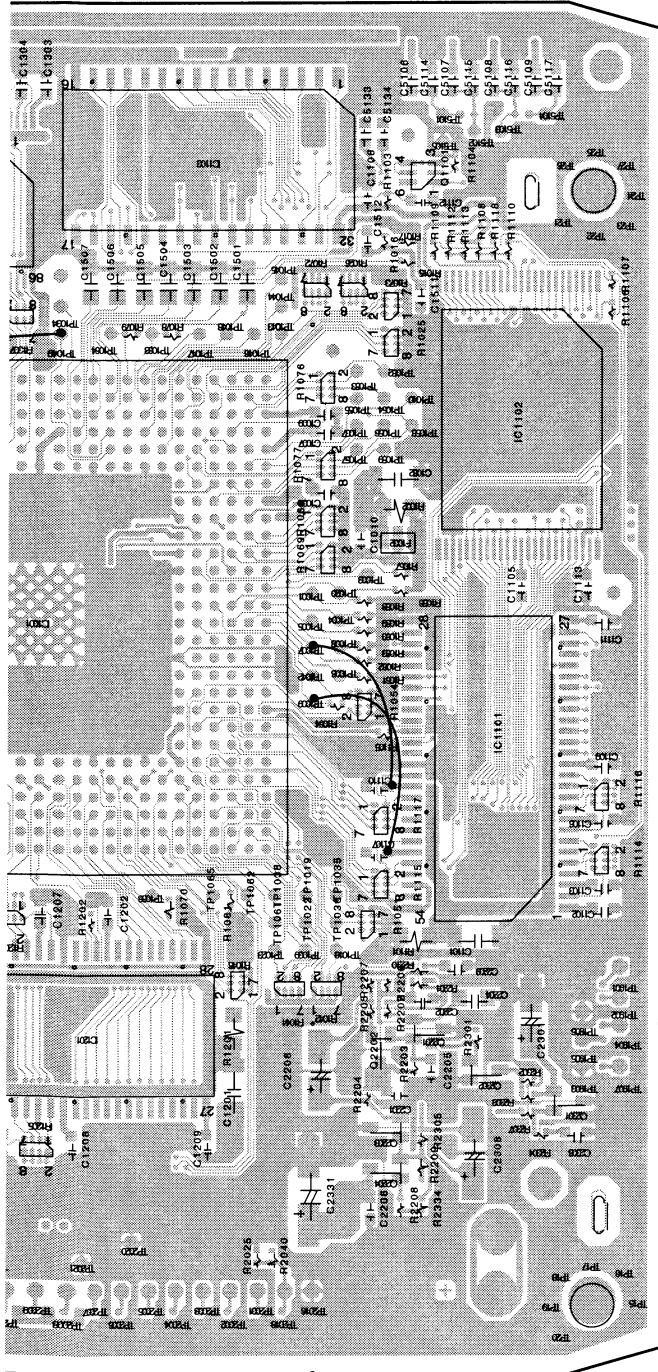
D

SIDE B

A

| | | |
|--------|-------|--------|
| IC1103 | Q1101 | IC1102 |
| IC1001 | Q2202 | Q2201 |
| IC1201 | Q2203 | IC1101 |
| | Q2204 | Q2302 |
| | | Q2301 |

This PCB is six layer structure.



(VNP1931-A)

B

C

D

E

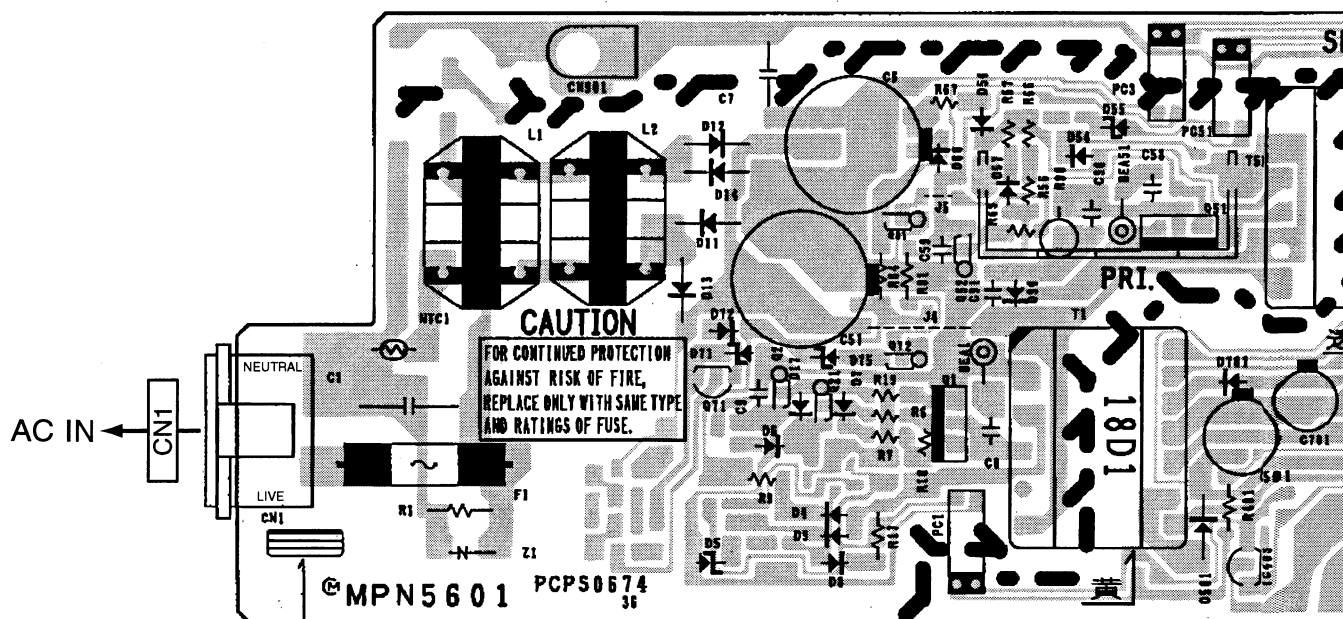
F

D

4.4 POWER SUPPLY UNIT

SIDE A

G POWER SUPPLY UNIT



Q71 Q2 Q81 Q52 Q51 IC403
Q21 Q1

G

4.5 FRJB and DVJB ASSYS

A

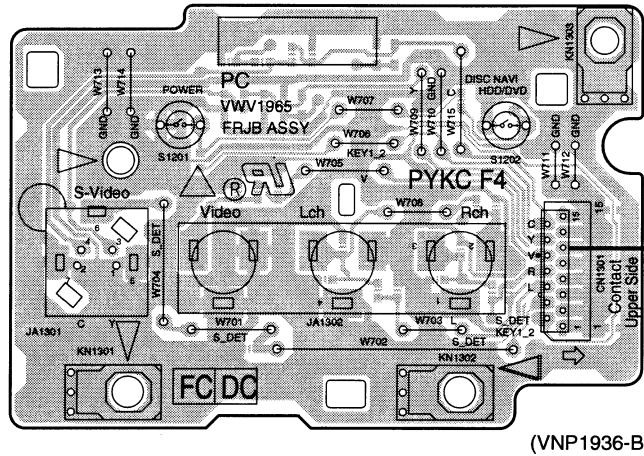
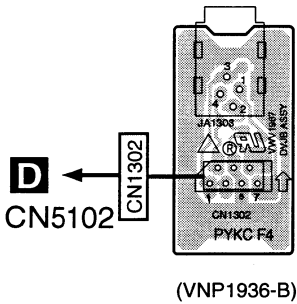
SIDE A

SIDE A

B

H DVJB ASSY

C FRJB ASSY



B CN3002

C

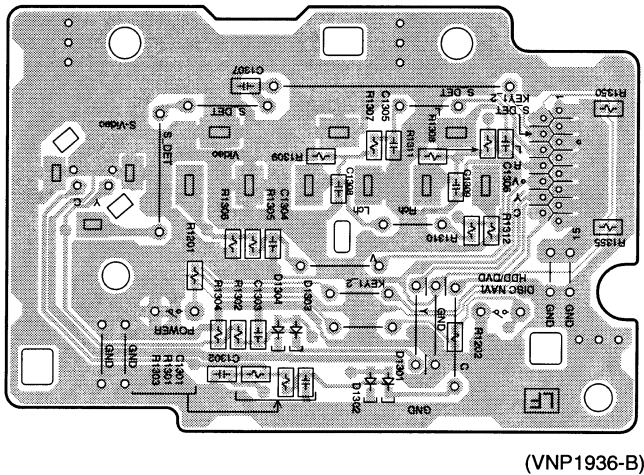
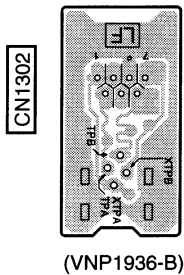
SIDE B

SIDE B

D

H DVJB ASSY

C FRJB ASSY



CN1301

E

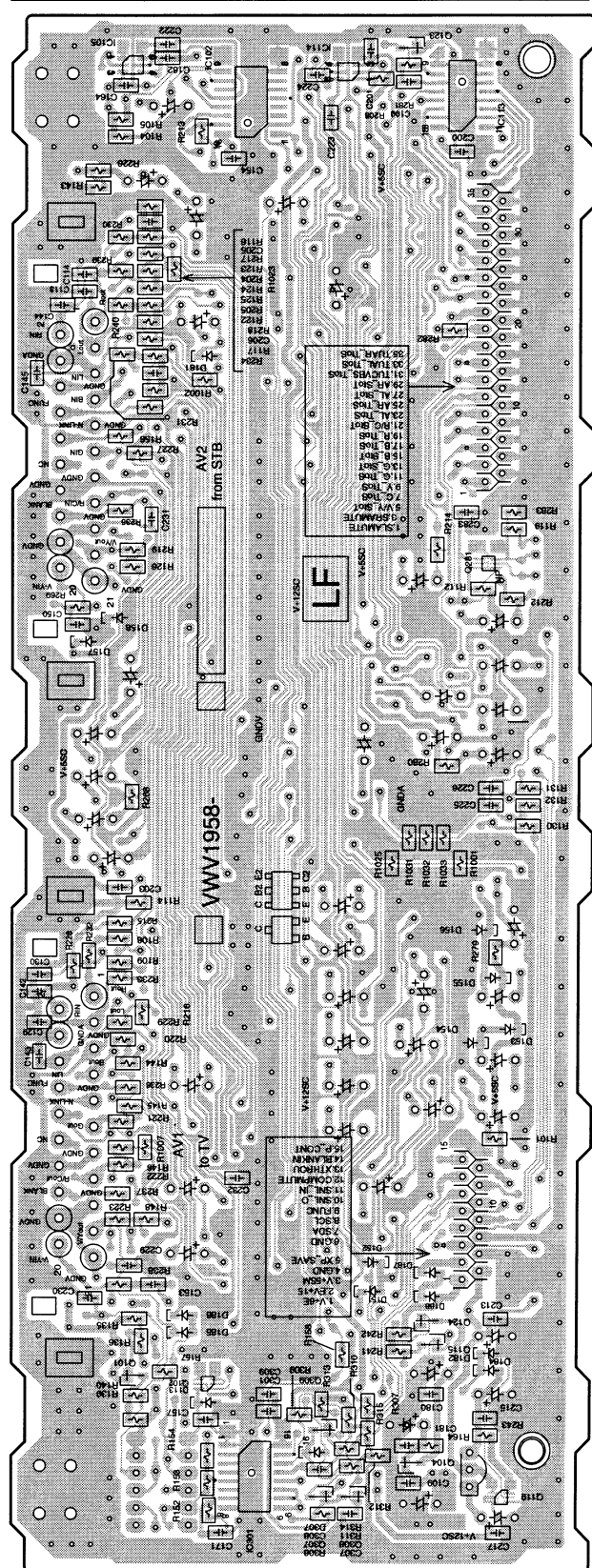
F

SIDE B

SIDE B

SCRB ASSY

IC105
Q101
Q102
IC102
IC301
IC114
Q207
Q309
Q308
Q123
Q104
Q115
Q124
Q281
IC113
Q119



(VNP1935-B)

DVR-3100-S

| Mark No. | Description | Part No. |
|-------------------|-----------------------------------|--------------|
| | CHIP BEAD | |
| | L3003, L3004, L3099, L3902 | VTL1096 |
| | CHIP BEAD | |
| | L4002 VCO COIL | VTL1164 |
| CAPACITORS | | |
| | C3356, C3357 | CCSRCH100D50 |
| | C2118, C2119, C2545, C2546 | CCSRCH101J50 |
| | C2818-C2820, C3362, C3365 | CCSRCH101J50 |
| | C2141, C2142, C2822, C2823, C4016 | CCSRCH102J50 |
| | C4022, C4023, C4028 | CCSRCH102J50 |
| | C3932 | CCSRCH121J50 |
| | C3917 | CCSRCH150J50 |
| | C3345, C3352, C3404, C3410, C3416 | CCSRCH180J50 |
| | C3422, C3428 | CCSRCH180J50 |
| | C3935 | CCSRCH181J50 |
| | C2357, C2358, C4029, C4030 | CCSRCH220J50 |
| | C2645 | CCSRCH221J50 |
| | C3343, C3350, C3960 | CCSRCH270J50 |
| | C2301, C3020, C3021 | CCSRCH330J50 |
| | C3405, C3412, C3417, C3423, C3429 | CCSRCH390J50 |
| | C2101, C2105, C2106, C2201, C3933 | CCSRCH470J50 |
| | C3561, C3562 | CCSRCH471J50 |
| | C4017, C4019 | CCSRCH560J50 |
| | C2354 | CCSRCH561J50 |
| | C3905, C4018 | CCSRCH5R0C50 |
| | C3344, C3351, C3451, C3936 | CCSRCH680J50 |
| | C3901, C4021 | CCSRCH6R0D50 |
| | C3341, C3347 | CCSRCH8R0D50 |
| | C2273 | CCSRCH4R0C50 |
| | C2353, C2801, C2802, C2810-C2817 | CEAT100M50 |
| | C3001, C3364, C3641, C3642, C4007 | CEAT100M50 |
| | C4012 | CEAT100M50 |
| | C203, C2111, C2254, C2533, C2534 | CEAT101M10 |
| | C2544, C2553, C2622, C2623, C2626 | CEAT101M10 |
| | C3083, C3301, C3310, C3349, C3403 | CEAT101M10 |
| | C3504, C3518, C4011, C4013 | CEAT101M10 |
| | C4032, C4033 | CEAT101M10 |
| | C2582, C2584, C2642, C2804, C2807 | CEAT101M16 |
| | C3555, C3928, C4002, C4004 | CEAT101M16 |
| | C3013, C3507, C3511 | CEAT102M6R3 |
| | C3552, C3554 | CEAT220M25 |
| | C3533 | CEAT221M16 |
| | C3201 | CEAT330M25 |
| | C4009 | CEAT3R3M50 |
| | C2640 | CEAT471M16 |
| | C3010, C3904 | CEAT471M6R3 |
| | C3911, C3912 | CKSQYB225K10 |
| | C3918, C3920, C3921, C3923, C3925 | CKSRYB102K50 |
| | C2104, C2355, C2821, C3317, C3902 | CKSRYB103K50 |
| | C3906, C3907, C3930, C4010, C4024 | CKSRYB103K50 |
| | C2102, C2103, C3302, C3305-C3308 | CKSRYB104K16 |
| | C3311, C3314-C3316, C3505, C3508 | CKSRYB104K16 |
| | C3909 | CKSRYB104K16 |
| | C3012, C3023, C3908, C3916 | CKSRYB222K50 |
| | C3924 | CKSRYB224K10 |
| | C4015, C4027 | CKSRYB472K50 |
| | C2112, C2140, C2202, C2204, C2210 | CKSRYF104Z25 |
| | C2251, C2302, C2303, C2351, C2352 | CKSRYF104Z25 |
| | C2356, C2521, C2522, C2531, C2532 | CKSRYF104Z25 |

| Mark No. | Description | Part No. |
|----------|-----------------------------------|--------------|
| | C2535, C2541-C2543, C2551, C2552 | CKSRYF104Z25 |
| | C2581, C2583, C2621, C2624, C2625 | CKSRYF104Z25 |
| | C2641, C2643, C2646, C2808, C2809 | CKSRYF104Z25 |
| | C3017, C3084, C3304, C3312, C3313 | CKSRYF104Z25 |
| | C3346, C3353, C3407, C3415, C3419 | CKSRYF104Z25 |
| | C3425, C3431, C3503, C3506, C3514 | CKSRYF104Z25 |
| | C3519, C3521, C3530-C3532, C3551 | CKSRYF104Z25 |
| | C3903, C3910, C3929, C3931, C3934 | CKSRYF104Z25 |
| | C4001, C4003, C4006, C4008, C4014 | CKSRYF104Z25 |
| | C4020, C4026, C4031, C4034 | CKSRYF104Z25 |
| | C3005 | CKSRYF104Z50 |
| | C2110, C2113-C2115, C2152, C2154 | CKSRYF105Z10 |

RESISTORS

| | |
|-----------------------------------|--------------|
| R4001, R4004 | RS1/10S0R0J |
| R4009 | RS1/10S100J |
| R3098 | RS1/10S150J |
| R3346, R3349, R3352, R3356 | RS1/16S5600F |
| R3406, R3418, R3428, R3438, R3443 | RS1/16S6800F |
| R2815, R2817, R2818, R3303-R3305 | RS1/16S75R0F |
| R3451, R3568, R3569, R3571 | RS1/16S75R0F |
| VR3901 (10K) | VCP1156 |
| Other Resistors | RS1/16S###J |

OTHERS

| | |
|-----------------------------|-------------|
| U3001 TV TUNER MODULE | VXF1023 |
| X2271 (32kHz) | VSS1143 |
| X2351 (4.433619MHz) | VSS1176 |
| X2001 (10MHz) | VSS1188 |
| X4001 (18.432MHz) | VSS1189 |
| CN2006, CN2009 KR CONNECTOR | B2B-PH-K |
| CN3003 2P TOP POST | B2P-SHF-1AA |
| CN2003 KR CONNECTOR | B8B-PH-K |
| CN211 15P FFC CONNECTOR | HLEM15S-1 |
| CN2005 19P FFC CONNECTOR | HLEM19S-1 |
| CN210 35P FFC CONNECTOR | HLEM35S-1 |
| CN2007 9P FFC CONNECTOR | HLEM9S-1 |
| JA3081 OPTICAL LINK OUT | JFJ1001 |
| JA2201 REMOTE CONTROL JACK | RKN1004 |
| CN2004 KR CONNECTOR | S13B-PH-K |
| CN2001 8P SIDE POST | S8B-EH |
| 0 PCB BINDER | VEF1040 |
| BT2271 LITHIUM BATTERY | VEM1034 |
| JA2832 JACK | VKB1192 |
| JA3551 JACK | VKB1193 |
| CN2008 21P FFC CONNECTOR | VKN1252 |
| CN3001 32P FFC CONNECTOR | VKN1263 |
| CN3002 15P FFC CONNECTOR | VKN1275 |
| ST2271 BATTERY SOCKET | VKX1015 |
| 2007 SCREW PLATE | VNE1948 |
| KN2001-KN2003 | VNF1084 |
| WRAPPING TERMINAL | |

FRJB ASSY SEMICONDUCTORS

| | |
|-------------|----------|
| D1301-D1304 | UDZS5.6B |
|-------------|----------|

SWITCHES AND RELAYS

| | |
|--------------|---------|
| S1201, S1202 | VSG1009 |
|--------------|---------|

Mark No. Description Part No.**CAPACITORS**

C1308, C1309

CCSRCH471J50

RESISTORS

Other Resistors

RS1/16S###J

OTHERS

JA1302 3P JACK
JA1301 Y/C CONNECTOR
CN1301 15P FFC CONNECTOR
KN1301-KN1303
WRAPPING TERMINAL

VKB1189
VKB1190
VKN1275
VNF1084

**D MAIN ASSY
SEMICONDUCTORS**

IC3301
IC3101
IC2301
IC1103
IC5204

AD1895AYRS
AK5381VT
BA7655AF
CY62148VLL-70ZI
K4S161622D-TC80

IC1101
IC1401
IC1001
IC2331
IC5002

K4S281632E-TC75
K4S561632D-TC75
M65672WG-C
MM1508XN
MM1562FF

IC1301
IC4001
IC4004, IC4006
IC4007
IC4206, IC5301, IC5321

MT48LC4M32B2TG-6
NJM2370R12
NJM2872F05
NJM2880U1-33
NJU7013F

IC3201
IC4008
IC4002
IC4003
IC4005

PCM1742KE
PQ012FZ01ZP
PQ070XZ02ZP
PST3428U
PST3809U

IC3402
IC4101
IC3001
IC3002
IC5341

SM8707KV
SN74AHC2G53HDCT
TC74LCX541FT
TC74VHC14FT
TC74VHC157FT

IC3403, IC4205, IC5322
IC3251
IC5101
IC5202
IC1102

TC7WHU04FU
UPC4570G2
UPD72852AGB-8EU
UPD72893AGD-LML
VYW2116

IC1201
Q2101-Q2105, Q2201, Q2203, Q2301
Q2312
Q2202, Q2222
Q2302, Q2311

W986416DH-6
2SA1576A
2SA1576A
2SC4081
DTC114EUA

Q2402, Q2403
Q1101
Q3201, Q3202
Q1102
Q2001

HN1B04FU
HN1K03FU
RN1903
RN4982
UMF21N

D3001, D3002, D3101-D3104
D5321
D5322
D4201
D1111, D4001

1SS355
HVC359
HVC362
MA2ZV05
RB521S-30

Mark No. Description Part No.**COILS AND FILTERS**

F3102, F3401-F3403, F4004, F4201
F5101 CHIP BEAD
L5301, L5321
L4202
F3201 CHIP SOLID INDUCTOR

DTF1069
DTF1069
LCYA100J2520
LCYA1R2J2520
VTF1096

L5101, L5102 CHOKE COIL
L2101 CHIP COIL
L4201 CHIP BEAD
L5103-L5106

VTH1043
VTL1067
VTL1079
VTL1082

CAPACITORS

C5311, C5329
C3253, C3258
C5105
C5325, C5327
C3207

CCSRCH100D50
CCSRCH101J50
CCSRCH271J50
CCSRCH330J50
CCSRCH331J50

C4208
C5131-C5138
C5326
C3254, C3257
C5121, C5122

CCSRCH390J50
CCSRCH4R0C50
CCSRCH5R0C50
CCSRCH681J50
CCSRCH8R0D50

C2208, C2317, C4002, C4034, C5203
C5322
C3251, C3255, C4001, C4004, C4029
C2101, C2221, C2331, C2405, C2501
C3201, C3204, C3206, C3301, C3309

CEVW100M16
CEVW100M16
CEVW101M16
CEVW101M6R3
CEVW101M6R3

C2301, C5102
C1054, C1055, C1057, C1058
C1060, C1061, C4022
C3106
C5321

CEVW220M6R3
CEVW221M4
CEVW221M4
CEVW2R2M50
CEVW470M16

C2308, C3102, C3107, C4003, C5205
C5207, C5221, C5341
C5301
C2204, C2334, C4206, C5309
C1901, C4014, C4019, C4033, C4036

CEVW470M6R3
CEVW470M6R3
CEVW4R7M35
CKSQYB105K10
CKSQYB225K10

C5006
C1501-C1507
C1004, C1012, C1014, C1029, C1034
C1040, C1044, C1049, C1051
C1110-C1112, C1207, C1208, C1307

CKSQYB225K10
CKSQYB475K6R3
CKSRYB102K50
CKSRYB102K50
CKSRYB102K50

C1311, C1313, C1407, C1408, C3303
C3307, C3408
C1003, C1027, C1037, C1052, C1109
C1206, C1305, C1308, C1310, C1406
C2305, C3003, C3004, C4018, C4020

CKSRYB102K50
CKSRYB102K50
CKSRYB103K50
CKSRYB103K50
CKSRYB103K50

C4207, C5214, C5222, C5224
C1508-C1510, C2225, C2311, C4104
C5306
C4103
C5328

CKSRYB103K50
CKSRYB104K16
CKSRYB104K16
CKSRYB223K50
CKSRYB473K25

C2202
C1002, C1005, C1007-C1010, C1016
C1018, C1019, C1021-C1023
C1025, C1026, C1028, C1030, C1035
C1038, C1041, C1042, C1047, C1102

CKSRYB563K16
CKSRYF104Z25
CKSRYF104Z25
CKSRYF104Z25
CKSRYF104Z25

C1105, C1106, C1108, C1114, C1202
C1204, C1302, C1304, C1312, C1402
C1404, C2102-C2106, C2201, C2206
C2222, C2306, C2319, C2332

CKSRYF104Z25
CKSRYF104Z25
CKSRYF104Z25
CKSRYF104Z25

| Mark No. | Description | Part No. |
|-----------------------------------|--------------|----------|
| C2406, C2407, C2502-C2506, C3001 | CKSRYF104Z25 | |
| C3006, C3101, C3105, C3108 | CKSRYF104Z25 | |
| C3202, C3203, C3205, C3252, C3256 | CKSRYF104Z25 | |
| C3302, C3308, C4006-C4008, C4010 | CKSRYF104Z25 | |
| C4012, C4013, C4017, C4021 | CKSRYF104Z25 | |
| C4024-C4026, C4032, C4035, C4107 | CKSRYF104Z25 | |
| C4202, C4203, C4209, C5101, C5103 | CKSRYF104Z25 | |
| C5111-C5113, C5118-C5120 | CKSRYF104Z25 | |
| C5123-C5127, C5204, C5206 | CKSRYF104Z25 | |
| C5208-C5213, C5215-C5218 | CKSRYF104Z25 | |
| C5225-C5230, C5308, C5310, C5323 | CKSRYF104Z25 | |
| C5342, C5343 | CKSRYF104Z25 | |
| C1001, C1006, C1011, C1013, C1017 | CKSRYF105Z10 | |
| C1024, C1036, C1039, C1045, C1048 | CKSRYF105Z10 | |
| C1050, C1053, C1103, C1107, C1113 | CKSRYF105Z10 | |
| C1203, C1205, C1209, C1303, C1306 | CKSRYF105Z10 | |
| C1309, C1403, C1405, C1409, C2507 | CKSRYF105Z10 | |
| C3404-C3407, C4027, C4028 | CKSRYF105Z10 | |
| C4030, C4031, C4105, C4201, C4401 | CKSRYF105Z10 | |
| C4501, C5110, C5231 | CKSRYF105Z10 | |
| C1056, C1059, C1062, C1101, C1104 | CKSYF106Z10 | |
| C1201, C1301, C1401, C3402, C3403 | CKSYF106Z10 | |
| C4015 | CKSYF106Z10 | |
| VC4201 (10pF) | VCM1012 | |

RESISTORS

| | |
|-----------------------------------|---------------|
| R1025, R1026, R1042-R1046 | RAB4CQ103J |
| R1048-R1051, R1054, R1068, R1069 | RAB4CQ103J |
| R1072, R1073, R5218-R5221 | RAB4CQ103J |
| R5229, R5230, R5247, R5249-R5252 | RAB4CQ103J |
| R5255, R5258, R5259, R5273-R5275 | RAB4CQ103J |
| R5289, R5290 | RAB4CQ103J |
| R1408-R1411, R4302-R4306 | RAB4CQ220J |
| R4401, R4404, R4410, R4416, R4417 | RAB4CQ223J |
| R4423, R4502, R4506, R4512 | RAB4CQ223J |
| R4518, R4519, R4525 | RAB4CQ223J |
| R1114-R1117, R4405-R4408, R4436 | RAB4CQ330J |
| R1303-R1310, R1404-R1407 | RAB4CQ560J |
| R1203-R1206 | RAB4CQ680J |
| R5103 | RN1/16SE5101D |
| R5108 | RN1/16SE9101D |
| R1001-R1009, R1101, R1102, R1201 | RS1/10S0R0J |
| R1301, R1401, R2017, | RS1/10S0R0J |
| R3002, R3102, R3201, R3252, R3301 | RS1/10S0R0J |
| R3303, R4001, R4006, R4009, R4014 | RS1/10S0R0J |
| R4016, R4108, R4109, R5102 | RS1/10S0R0J |
| R5207-R5209, R5292, R5322 | RS1/10S0R0J |
| R5321 | RS1/10S101J |
| R4013 | RS1/16S1001F |
| R3254, R3266 | RS1/16S1002F |
| R3253, R3265 | RS1/16S1201F |
| R4011 | RS1/16S1501F |
| R4012 | RS1/16S1800F |
| R1021, R1023 | RS1/16S2201F |
| R3251, R3269 | RS1/16S2202F |
| R2105, R2106, R2111, R2112, R2115 | RS1/16S3300F |
| R5104-R5107 | RS1/16S56R0D |
| Other Resistors | RS1/16S###J |

| Mark No. | Description | Part No. |
|----------|-------------|----------|
|----------|-------------|----------|

OTHERS

| | | |
|--------------------|---------------------|------------|
| CN4001 | PH CONNECTOR | S8B-PH-SM3 |
| CN1901 | 7P FFC CONNECTOR | VKN1299 |
| CN2501, CN5102 | 7P FFC CONNECTOR | VKN1411 |
| CN3001 | 21P FFC CONNECTOR | VKN1425 |
| CN4301 | 29P FFC CONNECTOR | VKN1433 |
| CN2001 | 32P FFC CONNECTOR | VKN1436 |
| CN4401 | 40P FFC CONNECTOR | VKN1794 |
| KN3 | EARTH METAL FITTING | VNF1109 |
| X4201 (27.000MHz) | | VSS1146 |
| X5101 (24.576MHz) | | VSS1184 |
| X4102 (27MHz) VCXO | | VSS1195 |

E MHL P ASSY SEMICONDUCTORS

| | |
|-----|-----------|
| IC1 | PDY081A |
| D1 | RB521S-30 |

CAPACITORS

| | |
|-------|--------------|
| C1 | CEVW101M6R3 |
| C2-C6 | CKSRYF104Z25 |
| C7 | CKSRYF105Z10 |

RESISTORS

| | |
|-----------------|-------------|
| R3 | RAB4C0R0J |
| R2 | RAB4C102J |
| R1 | RS1/16S0R0J |
| Other Resistors | RS1/10S###J |

OTHERS

| | | |
|-----|----------------------|---------|
| CN1 | 7P FFC CONNECTOR | VKN1411 |
| CN2 | B TO B CONNECTOR 30P | VKN1571 |

F FLKY ASSY SEMICONDUCTORS

| | |
|--------|--------|
| IC1001 | PT6315 |
|--------|--------|

COILS AND FILTERS

| | |
|-------|---------|
| L1001 | LAU220J |
|-------|---------|

SWITCHES AND RELAYS

| | |
|---------------------------|---------|
| S1001, S1002, S1004-S1008 | VSG1009 |
| S1003 | VSX1004 |

CAPACITORS

| | |
|---------------------------------|--------------|
| C1012 | CEJQ101M6R3 |
| C1010 | CEJQ220M35 |
| C1015 | CEJQ470M16 |
| C1001-C1004, C1006-C1009, C1011 | CKSRYB103K50 |
| C1013, C1016 | CKSRYB103K50 |

RESISTORS

| | |
|-----------------|-------------|
| Other Resistors | RS1/16S###J |
|-----------------|-------------|

OTHERS

| | | |
|--------|----------------------|------------|
| CN1001 | 19P FFC CONNECTOR | 9607S-19F |
| IC1002 | REMOTE RECEIVER UNIT | RPM7140-H4 |
| V1001 | FL TUBE | VAW1081 |
| | RUBBER SPACER | VEB1357 |
| 1001 | FL HOLDER | VNF1120 |

Mark No. Description Part No.

G POWER SUPPLY UNIT

OTHERS

△ P101 PROTECTOR(3A) AEK7050
△ P201, P401, P403, P404 AEK7067
PROTECTOR(2A)

H DVJB ASSY

OTHERS

JA1303 DV-TERMINAL VKB1186
CN1302 7P FFC CONNECTOR VKN1238

I SCRB ASSY

SEMICONDUCTORS

IC104 BA4558F-HT
IC113 BU4052BCF
IC101 LA73026AV
IC114 MM1503XN
IC103, IC106, IC107 MM1506XN

IC105 MM1511XN
IC102, IC301 TC74HC4053AF
Q101, Q120-Q122, Q124 2SA1576A
Q118 2SC1740S
Q104, Q307-Q309 2SC4081

Q109, Q110 DTA124EUA
Q115, Q123 DTC124EUA
Q105, Q106 HN1C03FU
Q281, Q289 RN2903
Q102, Q119 RN4903

D113-D117, D130-D133, D181 1SS355
D184, D187, D188, D307 1SS355
D134 RB501V-40
D182 UDZS12B
D101-D112, D118-D121 UDZS5.6B

D123-D127, D129, D135-D150 UDZS5.6B
D185, D186 UDZS5.6B

COILS AND FILTERS

L103 LCYA220J2520

SWITCHES AND RELAYS

RY101 VSR1017

CAPACITORS

C142-C145 CCSRCH102J50
C225, C226 CCSRCH220J50
C307, C308 CCSRCH221J50
C113, C114, C127-C130 CCSRCH471J50
C203-C206 CCSRCH471J50

C115, C116, C227, C228 CEANP100M16
C158, C159, C165, C166 CEAT100M50
C168, C169, C212, C219-C221 CEAT100M50
C156, C161, C182 CEAT101M10
C103-C105, C147, C209, C214 CEAT101M16

C218 CEAT101M16
C151, C152, C160, C167, C170 CEAT102M6R3
C138 CEAT1R0M50
C102, C117, C118, C123-C126 CEAT220M25
C139-C141, C149 CEAT220M25

Mark No. Description Part No.

C207, C208 CKSQYB105K16
C110 CKSQYF105Z16
C121, C146, C150, C153, C162 CKSRYB103K50
C222-C224 CKSRYB105K10
C109, C135-C137, C148 CKSRYF104Z25

C154, C155, C157, C164, C180 CKSRYF104Z25
C200, C201, C213, C217, C301 CKSRYF104Z25
C303, C309, C401, C402 CKSRYF104Z25
C111, C112 CKSRYF105Z10

RESISTORS

R121, R126, R140, R143-R148 RS1/16S75R0F
R151, R207 RS1/16S75R0F
Other Resistors RS1/16S###J

OTHERS

CN204 15P FFC CONNECTOR HLEM15S-1
CN203 35P FFC CONNECTOR HLEM35S-1
JA101, JA102 SCART CONNECTOR VKB1157
101, 102 SCREW PLATE VNE1948

6. ADJUSTMENT

6.1 TUJB ASSY ADJUSTMENT



* It is not necessary to adjust the ASSY normally when exchanging the ASSY. But the adjustment is necessary when exchanging the Tuner Module and IC3003 VIF/SIF IC.

| No. | Adjustment Name | Adj. Point | Measurement Point | Adjustment Value | Adjustment State |
|-----|--|------------|---|----------------------------|---|
| 1 | VCO freerun frequency (AFC voltage) adjustment | L4002 | The solder land named "AFT2" (upper side) Q3901-Emitter | 1.90V \pm 0.20V Note1 | Terrestrial tuner input /through output. Any channel, RF Input \geq 60dBu System = B/G, I or D/K Manual Adjust (in GUI of Manual Ch Setting) = ON Note1 |
| 2 | AGC start point adjustment | VR3901 | CN3003 Pin1 (AGC) | 3.80V \pm 0.20V | Terrestrial tuner input Ch = E9(203.25MHz), Video= Blackburst RF Input = 60.0 \pm 1.0dBu System = B/G, I or D/K |

Note 1 : The adjustment spec. is defined without the thermal drift after the power on.
Therefore, start the adjustment at least 10 minutes after the power on.

B TUJB ASSY

SIDE A

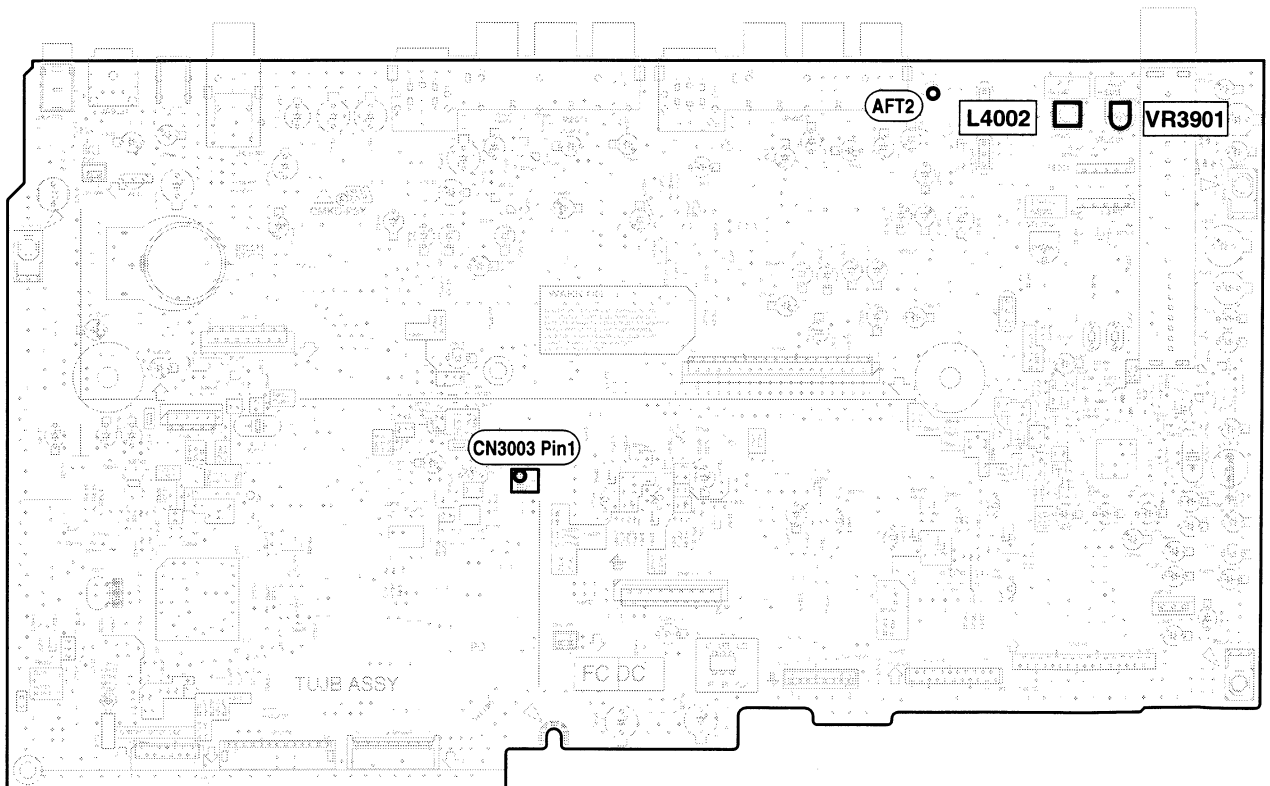


Fig.1 Adjustment Points (TUJB ASSY)

6.2 MAIN ASSY ADJUSTMENT



* It is not necessary to adjust the ASSY normally when exchanging the ASSY but confirm the data.

| No. | Adjustment Name | Adj. Point | Measurement Point | Adjustment Value | Adjustment State |
|-----|---|------------|--|-------------------------|------------------|
| 1 | Master clock free-running adjustment (Clock system adjustment) | VC4201 | MAIN ASSY IC3402 Pin8 (XTO) (SM8707KV) | 27.000000MHZ ± 130Hz | No signal input |

D MAIN ASSY

SIDE A

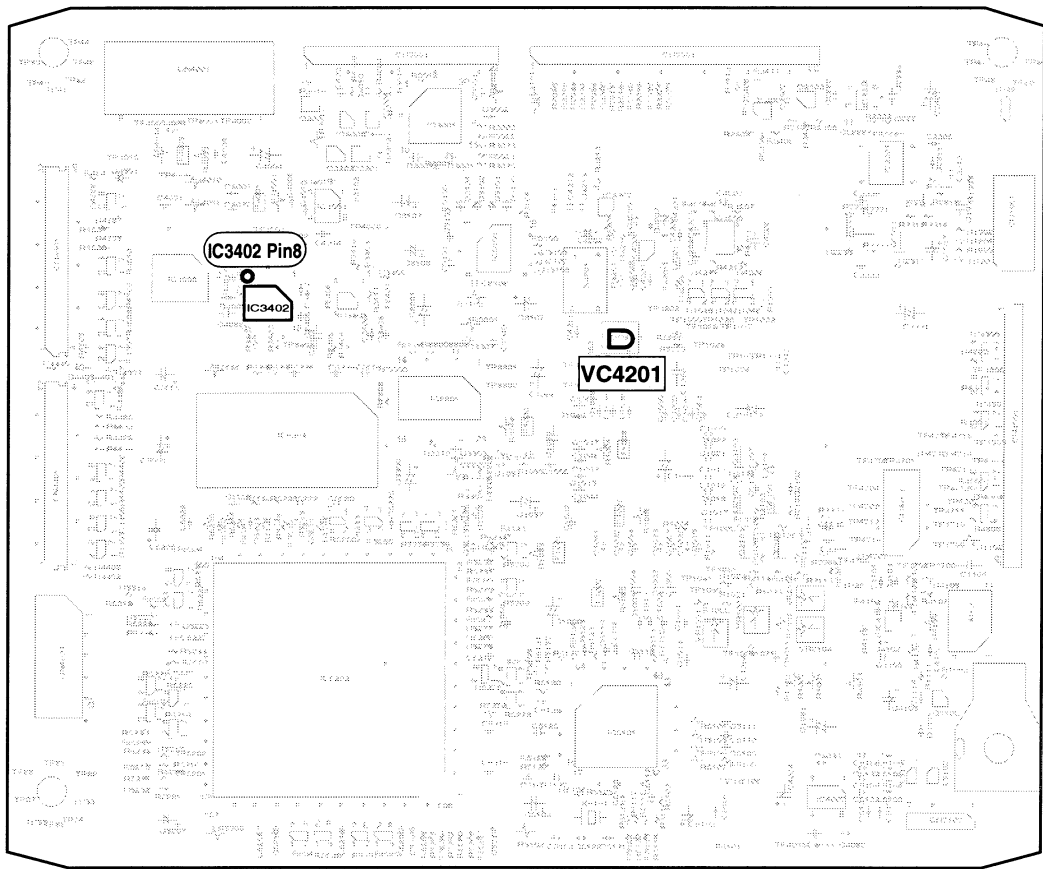


Fig.2 Adjustment Point (MAIN ASSY)

7. GENERAL INFORMATION

7.1 DIAGNOSIS

7.1.1 CPRM ID NUMBER AND DATA SETTING

■ Use DVD Recorder DATA DISC [GGV1134] and Service Remote Control Unit [GGF1381]

■ Entering the ID Number and ID Data for DVD Recorder

For the DVD recorder, it is necessary with the recoding/playback of DVD-RW disc to set an individual number (ID number) and ID data to each recorder. If the number and data are not set correctly with the following procedure, operations in the future may not be guaranteed. You will find the ID number to be set on the ID label on the rear panel.

Important: If no ID label is found on the rear panel, write down the specified ID number by checking it according to "How to confirm the ID number" shown below.

■ The Input is Necessary When:

- "CPRM ERR" is displayed on the FL display immediately after the power is turned on or in Stop mode.
- When the MAIN ASSY, DRIVE ASSY or the FLASH ROM is exchanged.

Note:

Be sure to enter the ID number in Stop mode.

Use the service remote control (GGF1381) for operations. Only opening/closing of the tray are performed from the player. The ID data disc is swept out automatically after the recorder has read the data from it.

■ How to Input the ID Number and ID Data

- ① To enter the input mode, press **[ESC]** + **[STEREO]** sequentially in a status with no ID number set, such as after FLASH-ROM downloading.



- ② As number input is enabled when the unit enters the input mode, input the 9-digit ID number.
(The entered number is also displayed on the FL display.)

[Recorder's ID Number Setting]

ID Number ?

> -----

<CLEAR> Exit

Input ID Number !



- ③ After inputting the number, press **[SEARCH]** to register the ID number.

[Recorder's ID Number Setting]

ID Number ?

> 0 0 0 0 0 0 0 1 OK ?

<PLAY> Compare Mode

<SEARCH> Enter

Input ID Number !



- ④ When the ID number has been registered, the unit enters the ID data input mode. (The FL display indicates "INSERT ID.") In this condition, place the ID data disc on the tray and close the tray using the CLOSE key **[■/▲]** on the player.

[Recorder's ID Data Setting]

<CLEAR> Exit

Insert The ID Data Disc !



- ⑤ While the data are being read, the message shown in the figure at left is displayed on the screen.
(The FL display indicates "LOAD ID.")

[Recorder's ID Data Setting]

Loading The ID Data Disc !



- ⑥ When the ID data have been read, the data are written to the FLASH-ROM.
(The FL display indicates "WRITE ID.")

- ⑦ When the ID data have been written to the FLASH-ROM, the message "Rom Write OK" is displayed on the screen.
(The FL display indicates "ID DATA OK.")

- ⑧ After confirming this message, press **CLEAR** to exit the input mode.

[Recorder's ID Data Setting]

⑥ → Wait Rom Writing !

[Recorder's ID Data Setting]

⑦ → Rom Write OK !

⑧ → <CLEAR> Exit

How to Confirm the ID Number

- ① Press **ESC**+**STEREO** sequentially with an ID number already set, and the unit enters the ID number confirmation mode.
- ② The set ID number is displayed on the screen (and on the FL display), permitting you to confirm it.
- ③ To exit this mode, press **CLEAR**.

[Recorder's ID Number Setting]

ID Number ?

② → [0 0 0 0 0 0 0 1]

Compare

> *****

③ → <CLEAR> Exit

Input ID Number !

How to Clear the ID Number

- ① Press **ESC**+**STEREO** sequentially with an ID number already set, and the unit enters the ID number confirmation mode.
- ② Input the same number as the ID number you have set.
- ③ After inputting the number, press **STOP**.
Only when the entered number matches the set ID number, the ID number is cleared and the unit exits this mode.
If the numbers do not match, you must return to step 2.
(**STOP** is not accepted until 9 digits are entered.)

[Recorder's ID Number Setting]

ID Number ?

[0 0 0 0 0 0 0 1]

Compare

> *****

<CLEAR> Exit

<STEREO> ID Data Setting Mode

Input ID Number !

[Recorder's ID Number Setting]

ID Number ?

[0 0 0 0 0 0 0 1]

Compare

> 0 0 0 0 0 0 0 1 OK ?

<PLAY> Enter

③ → <STOP> Memory Clear

<STEREO> ID Data Setting Mode

Input ID Number !

7.1.2 SERVICE MODE

For service operations, use the GGF1381 remote control unit for service.

The Service-mode screens consist of nine mode screens, which are classified into such rough categories as recording system and VR playback system, and their subscreens.

- **How to enter Service mode** : Press the ESC then DISP keys in turn while no GUI is displayed. The first screen (version information, etc.) shown below is displayed.
- **How to exit Service mode** : Press the ESC key.
- **How to advance to the next Service-mode screen** : While the first screen is displayed, press directly one of the keys 1-9. For service, use the keys 2, 4 or 5, as shown below.
- **How to advance to a subscreen within the same Service-mode screen** : Press the DIG/ANA key. Pressing the DIG/ANA key repeatedly will change the subscreens within the same Service-mode screen cyclically.

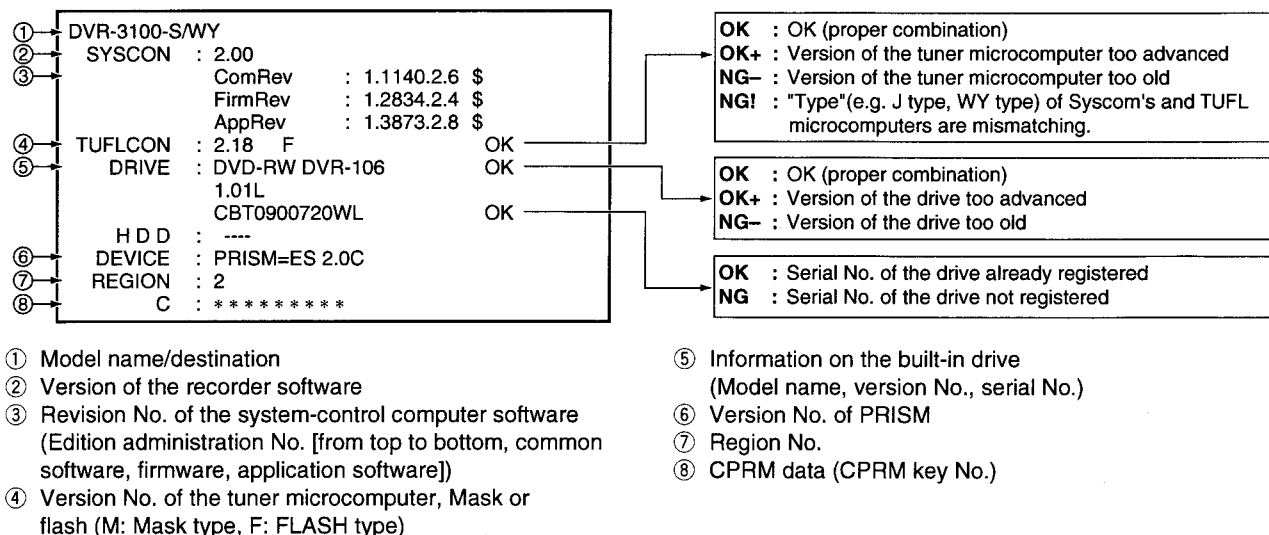
■ The Service-mode screens to be used for service are as follows:

- 1 = First screen: Version information, etc.
- 2 = Second screen: ATA/ATAPI debug screen (Writer data)
- 4 = Fourth screen: Error log for the VR recording system
- 5 = Fifth screen: Error log for the VR playback system

Note: After entering one of the Service-mode screens, if you wish to shift to another Service-mode screen, exit Service mode first, then reenter Service mode and select your desired Service-mode screen.

■ Description of Each Service-mode screen

1. First screen (version information, etc.)



While the first screen shown above is displayed, press the DIG/ANA key to enter the subscreen shown below.

Note: Each time the DIG/ANA key is pressed, the display changes between the first screen and its subscreen.

• Subscreen: Result of error-rate measurement

ERR RATE : x.xe-x/

Note: Be sure to start playback after displaying this subscreen to calculate the error rate.

During playback in VR mode, the average error rate of the past 10 VOBUs is displayed, and during playback in DVD-Video or Video mode, the average error rate of the past 256 sectors is displayed. During playback in VR mode, the rotation rate of the drive (/: normal speed, no display = double speed) is also displayed.

2. Second screen (ATA/ATAPI debug screen)

Subscreen 1 of the second screen is displayed when the ESC, DISP, then "2" keys are pressed, in that order.

Note: Each time the DIG/ANA key is pressed, the display changes cyclically among subscreens 1 to 4.

• Subscreen 1: Command log (ALL) of ATA/ATAPI DEBUG OSD

```
ATA/ATAPI History - ALL
32 0100000000000A000 OK
32 2A00000DEBB000063000 OK
32 2A00000DF1E000063000 OK
32 2A00000DF81000063000 OK
32 2A00000DFE4000062000 OK
32 2A00000E046000063000 OK
32 2A00000E0A9000063000 OK
32 2A00000E10C000063000 OK
> 32 2A00000E16F00006200023A00
```

• Subscreen 2: Command log (ERROR) of ATA/ATAPI DEBUG OSD

• Subscreen 3: Writer maintenance information of ATA/ATAPI DEBUG OSD

The cumulative power-on time and error log that are administered by the writer are displayed. Such information is obtained when the power is turned on. Thereafter, each time the SEARCH key on the remote control unit for service is pressed while subscreen 3 is displayed, the updating command is sent, and the data on the subscreen are updated. Care must be taken when updating this subscreen, because an undesired command is inserted if it is executed while recording, etc.

| ATA/ATAPI Writer MaintenanceInfo | |
|----------------------------------|------------------------|
| ① Power ON | 00 00 00 0000 00000000 |
| 0102:56 | 01 00 00 0000 00000000 |
| DVD | 02 00 00 0000 00000000 |
| ② R0053:48 | 03 00 00 0000 00000000 |
| ③ W0022:16 | 04 00 00 0000 00000000 |
| CD | 05 00 00 0000 00000000 |
| ④ R0034:04 | 06 00 00 0000 00000000 |
| ⑤ W0000:00 | 07 00 00 0000 00000000 |
| | 00-00 |

← Error log for the Writer

- ① Power-on time/cumulative power-on time
- ② Duration of emission of the laser diode (LD) for DVD-R/DVD while reading
- ③ Duration of emission of the LD for DVD-W/DVD while writing
- ④ Duration of emission of the LD for CD-R/CD while reading
- ⑤ Duration of emission of the LD for CD-W/CD while writing

• Subscreen 4: ATA/ATAPI DEBUG OSD_LD degradation judgment

The degrees of degradation of the LD (laser diode) for the writer (LDs for CD and DVD separately), temperature, and RF level are displayed. To update the data on the subscreen, press the SEARCH key on the remote control unit for service while subscreen 4 is displayed. See Table 1 below for a description of each item and the conditions for updating data.

| ATA/ATAPI - LD Degrade | | | | |
|------------------------|-----|-------|-------|----|
| ① | CD | :0070 | 104% | OK |
| ② | DVD | :0068 | 96% | OK |
| ③ | TMP | :00A3 | 41 °C | |
| ④ | ADJ | :0067 | 26 °C | |
| ⑤ | RF | :3D70 | | |

Table 1: Description of each item and conditions for updating data

| No. | Item | Description | Conditions for updating by pressing the SEARCH key | Remarks |
|-----|------|---|--|---------|
| ① | CD | Degradation judgment of LD for CD. Regarded as NG when the value is 120% or higher (same standard as for the PC drive) | No disc inserted in the disc tray | *1 |
| ② | DVD | Degradation judgment of LD for DVD. Regarded as NG when the value is 120% or higher (same standard as for the PC drive) | No disc inserted in the disc tray | *1 |
| ③ | TMP | Current temperature inside the Writer | No disc inserted in the disc tray | *1 |
| ④ | ADJ | Temperature (approx. 25°C) inside the Writer during adjustment | No disc inserted in the disc tray | *1 |
| ⑤ | RF | RF level (16-bit data, proportional calculation performed using the actual RF level value with 2.5 V = 0xFFFF as the maximum value, displayed in 4-digit hexadecimal) | During playback of disc medium | |

*1 : For correct judgment, after leaving the unit at a normal temperature for some time, judgment must be performed immediately after the unit is turned on with no disc loaded.

3. Fourth screen (VR-recording-related error log)

Subscreen 1 of the fourth screen is displayed when the ESC, DISP, then "4" keys are pressed, in that order.

Note: Each time the DIG/ANA key is pressed, the display changes cyclically among subscreens 1 to 11.

• Subscreen 1:

```
RunFnc : ---- Ecl : **** Rate : **
-----
-----
-----
-----
-----
```

• Subscreens 2 and 3:

These subscreens are not for service use.

• Subscreen 4: Error log for VR recording

```
① Recording Error History Display
01-06-01 20:05:30 No SysHdr IN
01-06-02 00:22:10 Write Error
```

- ① Recording-related error log for the last 18 errors, divided into 2 screens
(generation time [year-month-day, hour:minute:second], error data in simplified description)

Notes:

- For details on error messages, see Table 2 "Description of VR-recording-related errors".
- The two error-log screens can be switched by pressing the SPEED+ or SPEED- key.

• Subscreens 5 to 11:

These subscreens are not for service use.

4. Fifth screen (Error log for VR playback)

Subscreen 1 of the fifth screen is displayed when the ESC, DISP, then "5" keys are pressed, in that order.

Note: Each time the DIG/ANA key is pressed, the display changes cyclically among subscreens 1 to 4.

• Subscreen 1:

```
G:01-01 00m00s00#-. -e-- 00.00M
Tgt: STOP Now: STOP Spd: 0
Man: STOP Sub: 0 VBF: 000 ABF: 00
TrMd: STOP TrSt: 0 TNo: Ver: 00
RvMd: STOP RvSt: 0 DNo: Aer: 00
CcSt: STOP Id: 00000000
Stc: 00000000 Tpp-Av1: +-0 V-A: +-0
MPEG2 720x480 A0 AC-3 2ch 0256k
NT ASP: 43 CGMS: 0 APS: 0 Src: 0
END: 00m00s00 Cell: 000
```

• Subscreen 2: Error log for VR playback

```
① G:01-01 00m00s00#-. -e-- 00000000
    m s Message m s Er
    L01:0000 Tr:NullbIk
    ② L02:1230 Tr:SchLate
    L02:4103 Tp:VobDif+
    L02:4104 Tp:VobDof-
```

- ① Data on location of the display
Original(G)/play list (L), title No., chapter No. (X:XX-XX),
time of the display (min, sec, frame [XXmXXsXX]), busy
mark of the virtual mechanical-control computer (#),
error rate of the transfer data (X.XeXX), playback logical
address (ID [XXXXXXXX])
- ② Error message log
Original(G)/play list (L), title No., time of generation (min,
sec [XX:XXXX]), playback-related error log for the last
13 errors (XX:XXXXXXXX)

Notes:

- For details on error messages, see Table 1 "Description of VR-playback-related errors".
- If a VR-playback-related error is generated, a problem in data reading from the disc may be suspected.
(The possibility of a problem on the drive side is high.)

• Subscreens 3 and 4:

These subscreens are not for service use.

Table 1: Description of VR-playback-related errors

| Error Message | Description |
|---------------|--|
| Tr : NullBlk | Transfer task: NULL at the top block (Detecting NG stream made at the DVR-1000 series and starting protection process.) |
| Tr : ReadErr | Transfer task: ATA read error |
| Tr : SchLate | Transfer task: ATA search late |
| Tr : SemTOvr | Transfer task: Timeout for gaining semaphore (no synchronization with the display) |
| Tr : NaviErr | Transfer task: Inconsistency between NAVI (navigator) of management data and actual NAVI |
| Tr : OrderEr | Transfer task: Inconsistent order |
| Mn : Av1Hang | Main task: Detects hang-up of AV decoder and starts recovery |
| ERR_RCV! | TPP task: Detects hang-up of AV decoder and starts recovery |
| Tp : VobDif+ | TPP task: The decoder STC advances by 1 VOB hour. |
| Tp : VobDif- | TPP task: The STC of the management information advances |
| Tp : midNULL | TPP task: The management information pointer designated was NULL. |
| Tp : ScanNg | TPP task: Failure to set the TPP memory when scanning was canceled. |
| Tp : RStepEr | TPP task: Although the reverse step had failed, the operation was forcibly terminated because the top cell was located. |
| Tp : tppErr | TPP task: Inconsistency occurred. |
| Rv : 1stTOvr | Reverse playback task: Timeout for waiting for interruption to the top VOBU immediately after starting decoding |
| Rv : OpnTOvr | Reverse playback task: Timeout for waiting for B-picture of the open GOP immediately after starting decoding |
| Rv : OpITOvr | Reverse playback task: Timeout for waiting for I-picture of the open GOP immediately after starting decoding |
| Rv : LnkTOvr | Reverse playback task: Timeout for waiting for link |
| Rv : LnkFail | Reverse playback task: Starts compensation by detecting link failure |
| Rv : R2FTOvr | Reverse playback task: Starts retrial after detecting timeout from reverse pause to forward pause |
| Rv : TopVbEr | Reverse playback task: Forced termination because of a possible error of the top data during reverse normal playback |
| Rv : OrderEr | Reverse playback task: Inconsistent order |
| Av : B/CTOvr | AV1: Buffer-clear timeout |
| Av : StrmOvr | AV1: Timeout for waiting for stream ready |
| Av : TpmTOvr | AV1: Timeout for TP mode change |
| Av : SpmTOvr | AV1: Timeout for a step command |
| CC_OS_ERR | Closed caption task: OS error |

Abbreviations:



STC = System Time Clock
VOBU = Video Object Unit
GOP = Group Of Picture
B-picture = Bidirectionally predictive-picture

I-picture = Intra-picture
P-picture = Predictive-picture
TP mode change = AV1 term (Trick Play mode change)

Table 2: Description of VR-recording-related errors

| Error Message | Description | Error Message | Description |
|-----------------|--|-----------------|---|
| Non Err * | Normal | Invalid TMVMG | Invalid TMP_VMG content |
| DRAM NG | Abnormality in access to the work DRAM | Unmatch Stamp * | Impossible to modify because of nonmatching time stamps |
| SRAM NG | Abnormality in access to the backup work SRAM | Virgin DISC | Blank disc |
| CPRM IC NG | Inappropriate CPRM IC | Fail Repair | Repair failed |
| Drive Destroy | The drive has crashed. | ReadOnly DISC * | Because some data are invalid, data cannot be written. |
| MKB REVOKED | Error in gaining data | Rzn Rsv NG | R-zone reserve failed. |
| WM Cracked | WM cracked | Rzn Cls NG | R-zone Closure failed. |
| VBR-SRAM NG | Abnormality in VBR SRAM | Rzn Rpr NG | R-zone repair failed. |
| BK BATT Down | Backup RAM data has been erased. | Bdr Opn | Opening of border failed. |
| BK FSYS Dirty | Backup RAM data has been written on the file system. | Bdr Cls | Closing of border failed. |
| Stream NG | Inappropriate input stream data | Format NG | Formatting failed. |
| Strm Start NG | Failure to start encoding (reasons not clear) | OPC NG | OPC failed. |
| AVEnc Hang | Inappropriate MPEG encoder | PCA Full | PCA has been used up. |
| No SysHdr IN | System packet is not input periodically. | RMA Full | RMA has been used up. |
| Strm Start NG | Timeout waiting for system packet input at the beginning | SW Vrec mode * | Switching to video recording routine is required. |
| IN Encode * | Changes cannot be made in the process of encoding | SW Vpb mode * | Switching to video playback routine is required. |
| EncModul Hang | Encoder routine is hung up. | NV Pck MK Err | Error in creating NAVI pack |
| Ourob Strm NG | Inappropriate stream data to the Ouroboros input | NV Pck DMA Err | Inappropriate NAVI pack DMA |
| WaterMark Det | Watermark detected | Cell Close NG | Cell closure failed. |
| BUF Overflow | Overflow of the stream buffer | Something * | Undetermined error |
| Drive Hang | The drive is hung up. | Status NG * | Abnormality in change of statuses |
| Write Err | The drive failed to write and could not be recovered. | Irr Action * | Incorrect action |
| Read Err | Reading failed, ECC failed, etc. | Abort * | Cancellation |
| Drv Hard Err | Abnormality in the drive hardware or firmware | Repair Exec | Repairing has been executed. |
| Mech No Res | No response from the mechanical-control computer | Format Exec | Formatting has been executed. |
| Drv TimeOut | Timeout waiting for drive operation | BUG | Some bugs |
| NWA Exhaust | NWA surpassed and impossible to use | BusReset Done | Bus Reset has been executed. |
| MKB Invalid | MKB reading error | Task No Activ | Task has not been activated. |
| Drv Err | General error of the drive | Mem get NG | Video mode memory has not been ensured. |
| DISC Full | No further data can be written because the disc is full. | V Rsv RzoneNG | Video mode reserve R-zone failed. |
| No More Info * | No more space in the internal work-management area | Tracon Tm NG | Video Mode Tracon transfer has not been completed. |
| No Perm * | No permission to write to the disc | DRAM CLR Err | Video Mode DRAM (Stream Buffer) clear failure |
| Limit Over * | Standard maximum limit exceeded | VTSL_B Wr Err | Video Mode VTSL BUP write error |
| Rec Pause * | No operation permitted during recording pause | VTSL Wr Err | Video Mode write error |
| No Video * | No video input (not locked) | TMP-VMG WrErr | Video Mode TMP VMGI write error |
| Relocation Do | VR-recording data was relocated. | CLS Rzon Fail | Video Mode Closure R-zone failure |
| Invalid Param * | Invalid parameter | V Categ ID NG | Inappropriate Category ID |
| Protect Src * | Source to be recorded is copy-protected. | V Cate Inf NG | Inappropriate Category information |
| Now Busy * | In the process of the emergency processing | V Ext TY NG | Typing error |
| Invalid Disc * | The disc cannot be recognized. | V Ext MAX Ovr | Count MAX exceeded |
| Invalid UDF * | Invalid UDF content | V ExtfToo Big | The extension file is too large. |
| Invalid VMG * | Invalid VMG content | HDD Destroy | HDD not recognized on the bus. |

Notes:

- Any error message marked with * is displayed "RecErr : -----" on the Subscreen 1 of the fourth screen.
-  : Indicates an error of the MPEG encoder
-  : Indicates an error of the drive system
- In a case of an error in the drive system, scratches or dirt on a disc, or a problem of the drive itself (dirty pickup) may be suspected.

Abbreviations:

ECC = 4 byte Code for Error Correction
 UDF = Universal Disc Format
 PCA = Power Calibration Area
 OPC = Optical Power Control
 NWA = Next Writable Address

VMG = Video Manager
 RMA = Recording Management Area
 MKB = Media Key Block
 TMP_VMG = Temporary Video Manager Information
 Border = from Lead-in to Lead-out

Table 3: List of Key Codes**How to enter each check mode**

- A Test mode remote control unit : [A8**]
 Remote control unit supplied with the DVR : [AB**]

| No. | Check Item | Key Input | Operation / purpose | Remarks |
|-----|--------------------------------|-------------------|--|--|
| 1 | EE system (same as preview) | [ESC] → [A.MON] | Turns on/off EE mode cyclically | Make sure that CGMS = 11 becomes when CGMS = 10 is input. EE mode: Simulation mode for recording status |
| | | [PLAY] | Starts the EE system in EE mode (main-unit setting rate) | |
| | | [STOP] | Stops the EE system in EE mode | |
| 2 | Error-rate measurement | [ESC] → [SIDE B] | V-mode recording: After recording for 10 seconds, the unit starts playback while displaying the error rate. DVD-Video: The error rate is automatically measured, then the result will be displayed. | For details, see "7.1.4 ERROR RATE MEASUREMENT". |
| 3 | Settings for specific areas | [ESC] → [CHP/TIM] | Enters Adjustment mode for AVIO settings | Settings are made for the selected input (TUNER, LINE). |
| | | [ESC] | Determines the settings, then exits Adjustment mode | For details, see "7.1.5 SETTINGS FOR SPECIFIC AREAS". |

How the ESC code is processed

- When the ESC code is received, ESCAPE mode is entered, but in combination with the code(s) that follow(s), a specific meaning is added.
- If ESC codes are received continuously, ESCAPE mode is retained.

7.1.3 DV DEBUG MODE

Press the ESC, DISP, then "8" keys, in that order.

```

① (DV/1394) Init:OK AV:01 DV:01      INT4:02
② [Recorder] GUID:00E036000160001 IRM
③ iPCR:C03F0000 oPCR:0000007A
④ [DV]      GUID:0080880303480E96
⑤ VN:VICTOR  MN:GR-D50K
⑥ TM:C3 TS:75 CT:32 WP:01 PS:FF OS:00

⑦ [DVdecode:Yes]
⑧ TC:00h20m35s02f RD:02/02/05 RT:10h34m50s
⑨ ASPECT:4:3      CGMS:000000 APSTB:00 DEC:525-60
⑩ SF:32kHz QU:12bit AMODE:4) Stereo
⑪ [DVencode:No]
⑫ TC:--h--m--s--f RD:--/--/-- RT:--h--m--s
⑬ ASPECT:----- CGMS:-- APSTB:--
  
```

Boldface alphanumerics : Fixed indications
Nonboldface alphanumerics : Variable indications

| No. | Item | Description | Remarks |
|-----|----------------|---|--|
| ① | Init | Whether the initialization of uPD72893A (1394LINK & DVcodec IC) has been completed (OK) or not (NG) | In a case of NG, communication with uPD72893A may have failed. |
| | AV | Number of AV devices on the local bus | |
| | DV | Number of DV devices on the local bus | If the number does not become 01 even if a DV device is connected, identification of that device fails. |
| | INT4 | Number of executing INT4(PIO) interrupt processing routines until a POWER ON notification arrives from uPD72893A (normally, 02) | |
| ② | GUID | GUID set in ConfigROM of the unit | In a case of ROOT (IRM), IRM is displayed at the rightmost of the GUID indication |
| ③ | iPCR | iPCR value of the unit | |
| | oPCR | oPCR value of the unit | |
| ④ | GUID | GUID set in ConfigROM of the connected DV device | Data are displayed only if one DV device is identified. If the connected DV device is ROOT (IRM), IRM is displayed at the rightmost of the GUID indication |
| ⑤ | VN | Vendor name set in ConfigROM of the connected DV device | Data are displayed only if one DV device is identified. (Depending on the device, the vendor name may not be set in ConfigROM.) |
| | MN | Model name set in ConfigROM of the connected DV device | Data are displayed only if one DV device is identified. (Depending on the device, the vendor name may not be set in ConfigROM.) |
| ⑥ | TM | Transport Mode data obtained from the DV device | Data are displayed only if one DV device is identified. |
| | TS | Transport State data obtained from the DV device | |
| | CT | Cassette Type data obtained from the DV device | |
| | WP | Copy-protection data obtained from the DV device | |
| | PS | Power-state data obtained from the DV device | |
| | OS | Output signal mode data obtained from the DV device | |
| ⑦ | [DVdecode:XXX] | Whether Yes (in the process of requesting DV input) or No is indicated in XXX | Normally, Yes is indicated only when CH is set to DV |

A

B

C

D

E

F

| No. | Item | Description | Remarks |
|-----|----------------|--|---|
| ⑧ | TC | Time-code data of the DVdecode Stream, or response data of the Time Code command | Stream time-code data are obtained when playback in the forward direction is performed. Otherwise, time-code data are obtained through an AV/C command. |
| | RD | Rec Date of DVdecode Stream | |
| | RT | Rec Time of DVdecode Stream | |
| ⑨ | ASPECT | Aspect Ratio of DVdecode Stream | |
| | CGMS | CGMS of DVdecode Stream (from left to right, CGMS data of bits 5-4: Audio ch2, bits 3-2: Audio ch1, and bits 1-0: Video) | Recording of DV input cannot be performed unless the value of CGMS is 00. |
| | APSTB | APS trigger bit of DVdecode stream | |
| | DEC | With/without DVdecode stream input | With input: Signal type (525-60, 625-50, 1125-60, 1250-50, or Invalid) is indicated, Without input: "No" is indicated. |
| ⑩ | SF | Sampling Frequency of DVdecode Stream | If SF is 44 kHz, it is considered that 44.1-kHz audio is input, and sound is muted on the unit. |
| | QU | QUANTIZATION of DVdecode Stream | |
| | AMODE | AUDIO MODE of DVdecode Stream | |
| ⑪ | [DVencode:XXX] | Whether Yes (in the process of requesting DV output) or No is indicated in XXX | Normally, Yes is indicated only with HDD or DVD playback |
| ⑫ | TC | TIME CODE of DVencode stream | |
| | RD | REC DATE of DVencode stream | |
| | RT | REC TIME of DVencode stream | |
| ⑬ | ASPECT | Aspect Ratio of DVencode stream | |
| | CGMS | CGMS of DVencode stream (common to video, audio ch1 and audio ch2) | Normally, sources other than CGMS=00 are not output. |
| | APSTB | APS trigger bit of DVencode stream | |

Simple Diagnosis

| Symptoms | Location in the Debug Screen | Items to be Checked, and Conditions | Possible causes |
|--|------------------------------|---|---|
| No operation for either DV input or output | ① | Check the init indication: OK: Initialization of DV-related LSIs (IC5101, IC5202) appropriately completed NG: Communication failure between DV-related LSIs (IC5101, IC5202) and HOST microcomputer (IC1001). Initialization of DV-related LSIs (IC5101, IC5202) has not been completed properly. Check the number of DV devices when one DV device is connected to the recorder: 01: The connected DV device is correctly identified. Other than 01: The connected DV device is not correctly identified. | Defective IC, defective soldering, defective power supply, etc. Defective DV terminals, improper connection of the DV-terminal board, defective IC, defective cables, an IEEE 1394 device other than the DV device connected |
| No picture nor sound for DV input | ⑦ | Check of DV decoding when the recorder channel is set to DV: Yes: The recorder is in the process of a DV input operation No: The recorder is not executing a DV input operation | Defective IC, defective soldering, defective power supply, etc. |
| | ⑨ | Check DEC: 525-60: An NTSC DV signal is input from the DV device. 625-50: A PAL DV signal is input from the DV device. No: No DV signal is input from the DV device. | Defective DV terminals, improper connection of the DV-terminal board, defective IC, defective source device Note: As to a model having the Input Line System setting, if the setting and the actual input signal system do not match, no picture appears. |
| DV input recording impossible | ⑨ | Check CGMS: 00: A copy-permitted source is being input. Other than 00: A copy-protected source is being input. | Recording cannot be performed for a copy-protected source. |
| No sound for DV input | ⑩ | Check SF: 32 kHz: An audio signal with 32-kHz sampling frequency is being input. 48 kHz: An audio signal with 48-kHz sampling frequency is being input. 44 kHz: An audio signal with 44.1-kHz sampling frequency is being input. | An audio signal with 44.1-kHz sampling frequency is muted. |
| No picture nor sound for DV output | ⑪ | Check DVencode during DVD/HDD playback: Yes: The recorder is in the process of a DV output operation No: The recorder is not executing a DV output operation (No is also displayed during playback of copy-prohibited sources or simultaneous-recording/playback.) | Defective IC, defective soldering, defective power supply, etc. |

7.1.4 ERROR RATE MEASUREMENT

How to enter Error-Rate Measurement mode

Press the ESC key then the SIDE-B key of the remote control unit for service to enter Error-Rate Measurement mode. During playback of DVD-VIDEO, Error-Rate Measurement mode can also be entered by pressing the ESC key then the PLAY key.

How to exit Error-Rate Measurement mode

Press the ESC key. The error-rate display disappears, and Error-Rate Measurement mode is exited.

Note: The error rate cannot be measured in VR mode or during CD playback.

Functions

① Video-mode recording (recording medium)

In this mode, DVD recording is automatically performed for 10 seconds, the recorded DVD title is played back while the error rate is being measured, then as soon as playback of the recorded DVD title is finished, playback stops.*1 After error-rate measurement is finished, the average error rate will be displayed on the FL display and OSD. Only in a case in which the calculation of the average error rate fails, the tray will open.

② DVD-VIDEO (playback medium)

Only during playback, when the ESC key then the SIDE-B key (or the ESC key then the PLAY key) are pressed, the error rate is calculated and displayed on the FL display and OSD.(*2) Only in a case in which the calculation of the average error rate fails, the tray will open.

Changes of display

Table 1: Video mode (recording medium)

| Operation | Display | |
|--|----------------|-------------------------|
| | FL Display | OSD (On Screen Display) |
| "ERROR RATE" is displayed on the FL display for an instant. | ERROR RATE | |
| DVD recording starts. | ERROR RATE | |
| DVD recording is performed for 10 seconds. | x x x x x | |
| The recorded DVD title is played back while the error rate is being measured, then as soon as playback is finished it stops. | ER x . x E - x | ERR RATE : x.xE-x - |
| After error-rate measurement is finished (*1), the average error rate, the measurement-finish mark (*), and the OK/NG-judgment result (*3) will be displayed on the FL display and OSD. (If the tray opens as a result of NG judgment, the display on the FL display and OSD will be retained.) | ER x . x E - x | ERR RATE : x.xE-x * OK |

Table 2: DVD-Video (playback medium)

| Operation | Display | |
|--|----------------|-------------------------|
| | FL Display | OSD (On Screen Display) |
| Only during playback, when the corresponding keys are pressed, the error rate is calculated and displayed on the FL display and OSD. (*2) | ER x . x E - x | ERR RATE : x.xE-x - |
| After error-rate measurement is finished (*1), the average error rate, the measurement-finish mark (*), and the OK/NG-judgment result (*3) will be displayed on the FL display and OSD. (If the tray opens as a result of NG judgment, the display on the FL display and OSD will be retained.) | ER x . x E - x | ERR RATE : x.xE-x - OK |

*1 : Whether error-rate measurement is finished or not is judged, as shown in Table 3 below.

Table 3: On judgment whether error-rate measurement is finished or not

| Recording Mode | Judgment whether error-rate measurement is finished or not | Recording/playback duration required for error-rate measurement |
|----------------|---|--|
| Video mode | After playback of a certain amount (*) of data Measurement of the 16 ECC blocks is performed 16 times, then the grand sum is used for calculation of the error rate. The capacity is as follows: 16 ECC blocks × 16 sectors × 2048 bytes × 16 times = 8388608 bytes = 67108864 bits | The time required for completion of error-rate measurement varies, depending on the input video signal to be recorded. (The more the motion in the input video signal to be recorded is animated, the shorter the playback time required for completion of error-rate measurement becomes.) |

*2 : During DVD-VIDEO error-rate measurement, even after error-rate measurement is finished, playback continues, and the display of the error rate results is retained. In this playback mode, if Error-Rate Measurement mode is exited by pressing the ESC key, then it is reentered by pressing the ESC and SIDE-B keys (or ESC and PLAY keys), the error rate will not be updated, and the previous value is displayed. To reset the previous error rate, stop disc playback.

*3 : OK/NG judgment

In DVD/VIDEO and Video Mode recording, OK/NG judgment is displayed under the following conditions:

Table 4: List of OK/NG threshold values

| Disc Type | Recording Mode | Finalized or not finalized | Reference Value | Display |
|-----------|----------------|----------------------------|----------------------|---------|
| DVD-VIDEO | | | 8.0×10^{-4} | OK / NG |
| DVD-R | Video mode | Finalized | 1.0×10^{-3} | OK / NG |
| | | Not finalized | 1.0×10^{-3} | OK / NG |
| DVD-RW | Video mode | Finalized | 1.0×10^{-3} | OK / NG |
| | | Not finalized | 1.0×10^{-3} | OK / NG |

7.1.5 VIDEO ADJUSTMENT FOR SPECIFIC AREA

Purposes: Depending on the area, jitter may appear in a picture received by the tuner, as conditions of signals received by the tuner are different from area to area. To correct this kind of problem, the function of the System Codec AVIO control section for adjusting signals received by the tuner can be used.

How to enter setting modes: To enter General Setting mode, press the ESC key then the CHP/TIM key of the remote control unit for service. To enter Specific Channel Setting mode, press the DIG/ANA key in General Setting mode.

How to exit setting modes: Press the ESC key. The setting mode is exited, the OSD disappears.

1. General Setting mode

This mode can be entered only during recording/playback stop. In this mode, each item and its current settings are displayed on the OSD. The currently selected input mode (TUNER or LINE) is displayed. If L1, L2, L3 or DV is selected for input, general settings for the line input can be made, and if TUNER is selected, general settings for the tuner input can be made.

[General Setting mode] (*2)

AVIO Specific Area Mode
Input - [TUNER]
Sync AGC : ON *
Threshold : Manual Threshold Level
Threshold Level : 0 *

* : setting is the default.

Table 1: Key operations in General Setting mode (effective only during recording/playback stop)

| Key | Operation | Setting (*: Default) | Remarks |
|---------------------------------------|--|--|---|
| INPUT SELECT, CHANNEL +/- (*R) | Switches inputs or channels. | — | — |
| ◀×3, ×3▶ (*1) | Sets Sync AGC. | ON (*) / OFF | — |
| ◀◀ CHAPTER SKIP, CHAPTER SKIP ▶▶ (*1) | Sets Threshold. | (*) Normal Auto Threshold Level Manual Threshold Level Pedestal Level | — |
| ◀◀ STILL STEP, STILL STEP ▶▶ (*1) | Sets Threshold level. | According to the setting of Threshold, the values can be changed within the range mentioned below. | — |
| | | • Normal: The value is fixed, with no display of the value. | — |
| | | • Auto Threshold Level: 0-8 (Default: 0) | The value can be changed with the ◀◀ or ▶▶ key. |
| | | • Manual Threshold Level: 0-8 (Default: 0) | The value can be changed with the ◀◀ or ▶▶ key. |
| CLEAR (*1) | Initializes the setting of General Setting mode. | — | The value can be changed with the ◀◀ or ▶▶ key. |
| | | | Pressing the key resets all settings of General Setting mode to the initial values. Settings of Specific Channel Setting mode are not affected (they are retained). |
| ESC | Exits AVIO setting for specific areas, clearing the OSD. | — | — |

*R: Refers to keys on the remote control unit supplied with this unit. The keys without "R" refer to the remote control unit for service.

- *1 : When a setting value is changed, that value is immediately displayed and is stored in nonvolatile memory.
 • Settings made will not be reset to the default settings even if resetting to the factory-preset values is performed.
- *2 : In General Setting mode, if the channel displayed has specific settings, the following will be displayed.

[Display in General Setting mode when the channel currently displayed has specific settings]

| | |
|--------------------------------------|--------------------------|
| AVIO Specific Area Mode | |
| Input - [TUNER] | |
| Sync AGC | : ON * |
| Threshold | : Manual Threshold Level |
| Threshold Level | : 0 * |
| This channel is set up individually. | |

2. Specific Channel Setting mode

This mode is entered when the DIG/ANA key is pressed in General Setting mode. In this mode, specific settings can be made for up to 12 channels. For channels that do not have specific settings, the settings of General Setting mode are applied.
 Display in Specific Channel Setting mode (A picture from the tuner can be viewed using the semitransparent OSD display.)

[Display in Specific Channel Setting mode]

[When specific channel settings have NOT been made]

| | |
|--------------------------|--------------------------|
| AVIO Specific Area Mode | |
| Input - [TUNER] | |
| Sync AGC | : ON * |
| Threshold | : Manual Threshold Level |
| Threshold Level | : 0 * |
| Individual setting state | |
| Input Channel - [1CH] | |
| Sync AGC | : --- |
| Threshold | : ---- |
| Threshold Level | : --h |

General Setting data

Specific Channel Setting data

* : setting is the default.

[When specific channel settings have been made]

| | |
|--------------------------|--------------------------|
| AVIO Specific Area Mode | |
| Input - [TUNER] | |
| Sync AGC | : ON * |
| Threshold | : Manual Threshold Level |
| Threshold Level | : 2 |
| Individual setting state | |
| Input Channel - [1CH] | |
| Sync AGC | : ON |
| Threshold | : Manual Threshold Level |
| Threshold Level | : 3 |

- If a channel that does not have specific settings is displayed, the setting figures are displayed as hyphens (--).
 If the setting figures are not displayed as hyphens, those settings have been specifically set even if they are identical to the default settings or those of General Setting mode.
- The channels to be displayed in "Input Channel" are as follows:
 - In a case of line input: L1-L3,DV
 - In a case of tuner input: Received channel (a channel to be set in specific channel settings)

Table 2: Key operations in Specific Channel Setting mode
(effective only during recording/playback stop)

| Key | Operation | Setting (*: Default) | Remarks |
|--------------------------------------|---|--|---|
| DIG/ANA | Switches cyclically between General Setting mode and Specific Channel Setting mode. | — | — |
| INPUT SELECT, CHANNEL +/- (*R) | Switches inputs or channels. | — | — |
| ◀ ×3, ×3 ▶ (*1) | Sets Sync AGC. | ON (*) / OFF | — |
| ◀◀ CHAPTER SKIP, CHAPTER SKIP ▶▶ | Sets Threshold. | (*) Normal Auto Threshold Level Manual Threshold Level Pedestal Level | — |
| ◀◀ STILL STEP, STILL STEP ▶▶ | Sets Threshold level. | According to the setting of Threshold, the values can be changed within the range mentioned below. | — |
| | | • Normal: The value is fixed, with no display of the value. | — |
| | | • Auto Threshold Level: 0-8 (Default: 0) | The value can be changed with the ◀◀ or ▶▶ key. |
| | | • Manual Threshold Level: 0-8 (Default: 0) | The value can be changed with the ◀◀ or ▶▶ key. |
| | | • Pedestal Level: 0-8 (Default: 0) | The value can be changed with the ◀◀ or ▶▶ key. |
| PLAY | All channels assigned to have specific settings are canceled, and the specific settings are reset to their default values. | — | Settings of General Setting mode are not affected. |
| CLEAR | If the channel currently selected is assigned to have specific settings, that assignment is canceled. (If that channel is canceled, the number of remaining channels for which specific channel settings can be made increases by 1.) | — | Pressing the key resets the settings of Specific Channel Setting mode for that channel to the initial values. Settings of General Setting mode are not affected. |
| PAUSE | The specific-setting data for the currently selected channel are reset to their default values. (But the assignment of a channel having specific settings is not canceled.) | — | Pressing the key resets the settings of Specific Channel Setting mode for that channel to the initial values. Settings of General Setting mode are not affected (retained). |
| ESC | Exits AVIO setting for specific areas, clearing the OSD. | — | — |

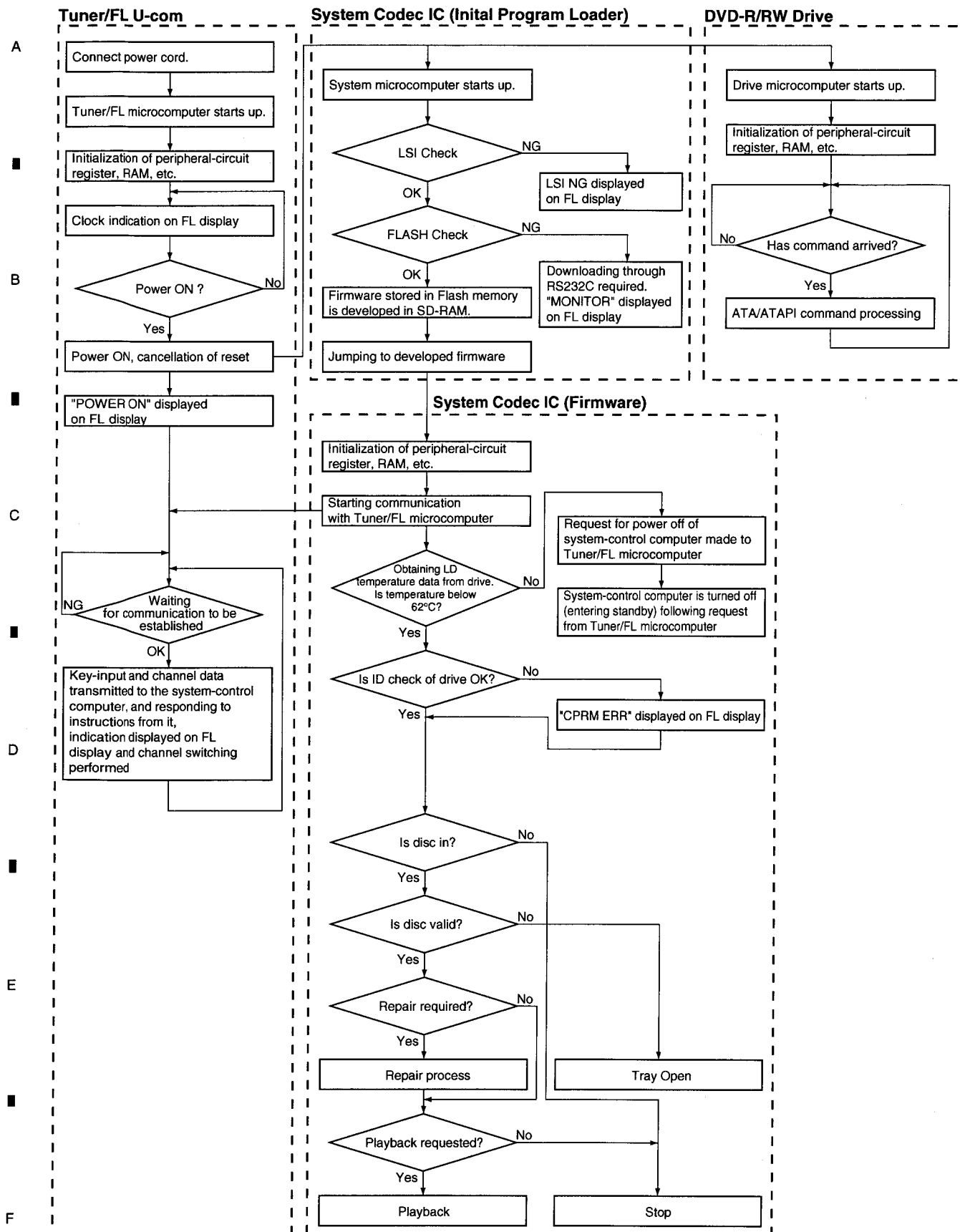
*R: Refers to keys on the remote control unit supplied with this unit. The keys without "R" refer to the remote control unit for service.

- Settings made will not be reset to the default settings even if resetting to the factory-preset values is performed.
- Screen display when Specific Channel settings are made on 12 (maximum) channels: In such a case, If a channel which does not have specific settings is selected, the individual setting state for that channel is not displayed, as shown in the figure below, and the settings cannot be modified. In such a case, if you wish to make Specific Channel Settings for the currently selected channel, you must clear the Specific Channel Settings for one or more channels beforehand.

**[With 12 channels having specific settings,
when the currently selected channel does not have specific settings]**

AVIO Specific Area Mode
Input - [TUNER]
Sync AGC : ON *
Threshold : Manual Threshold Level
Threshold Level : 3
Individual setting state
Sorry !
You can store only 12 channels
for Specific Area mode.

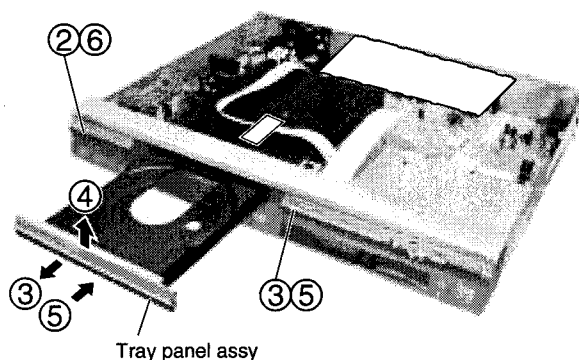
7.1.6 SETUP SEQUENCE



7.1.7 DISASSEMBLY

1 Bonnet S, Tray Panel Assy

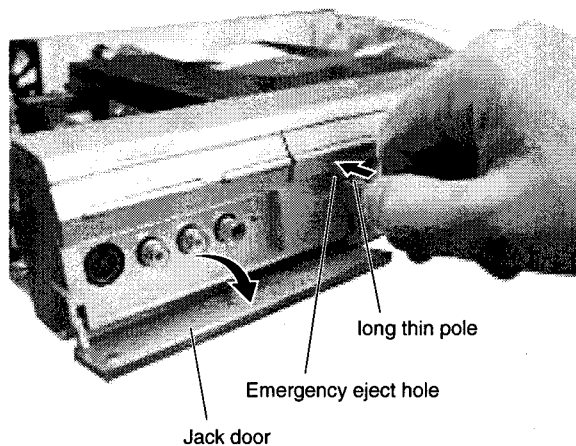
- ① Remove the bonnet by removing the eight screws.
- ② Press the ⏻ STANDBY/ON button to turn on the power.
- ③ Press the \blacktriangle button to open the tray.
- ④ Remove the tray panel assy.
- ⑤ Press the \blacktriangle button to close the tray.
- ⑥ Press the ⏻ STANDBY/ON button to turn off the power.



• How to open the tray when the power cannot be on

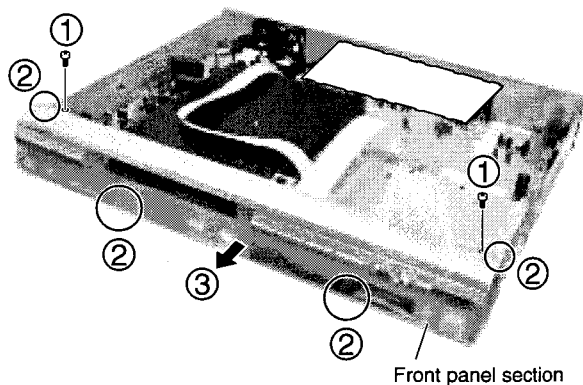
When the player cannot eject disc tray due to power failure or any other reasons, open the jack door, and use a long thin pole and push the emergency eject hole under the tray panel to eject.

Note: This photograph shows other models.
However, the work method is the same.



2 Front Panel Section

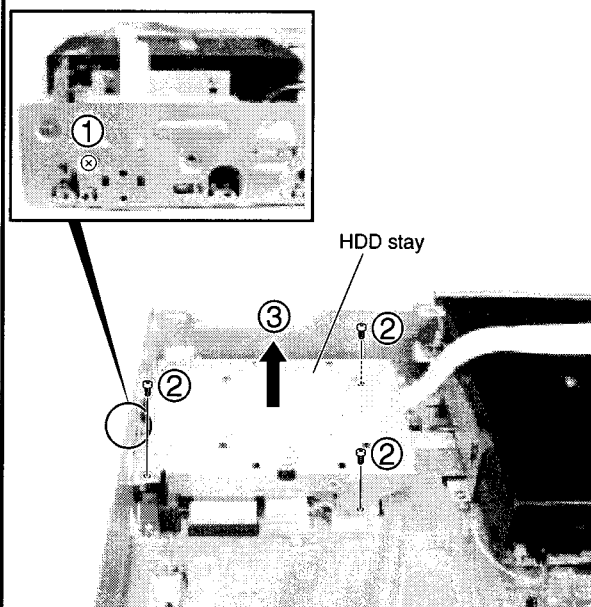
- ① Remove the two screws.
- ② Remove the four hooks.
- ③ Remove the front panel section.



Note: This photograph shows other models.
However, the work method is the same.

3 HDD Stay

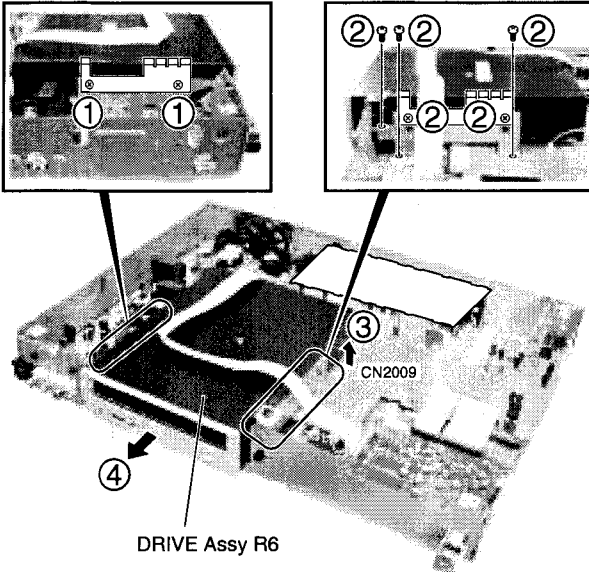
- ① Remove the one screw.
- ② Remove the three screws.
- ③ Remove the HDD stay.



4 DRIVE Assy R6

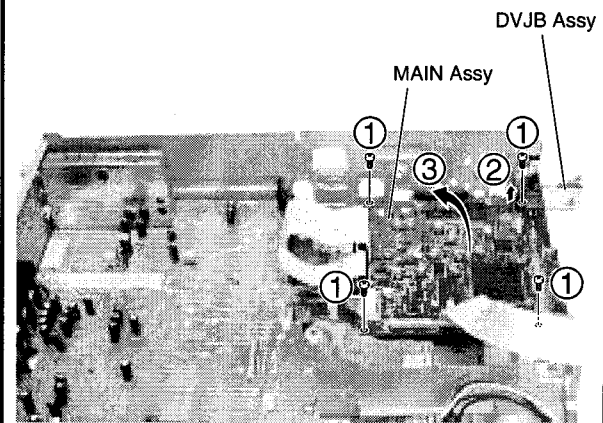
- ① Remove the two screws.
- ② Remove the five screws.
- ③ Disconnect the connector.
- ④ Remove the DRIVE Assy R6.

Note:
This photograph shows other models. However, the work method is the same.



5 MAIN Assy

- ① Remove the four screws.
- ② Disconnect the flexible cable from DVJB Assy.
- ③ Stand the MAIN Assy.



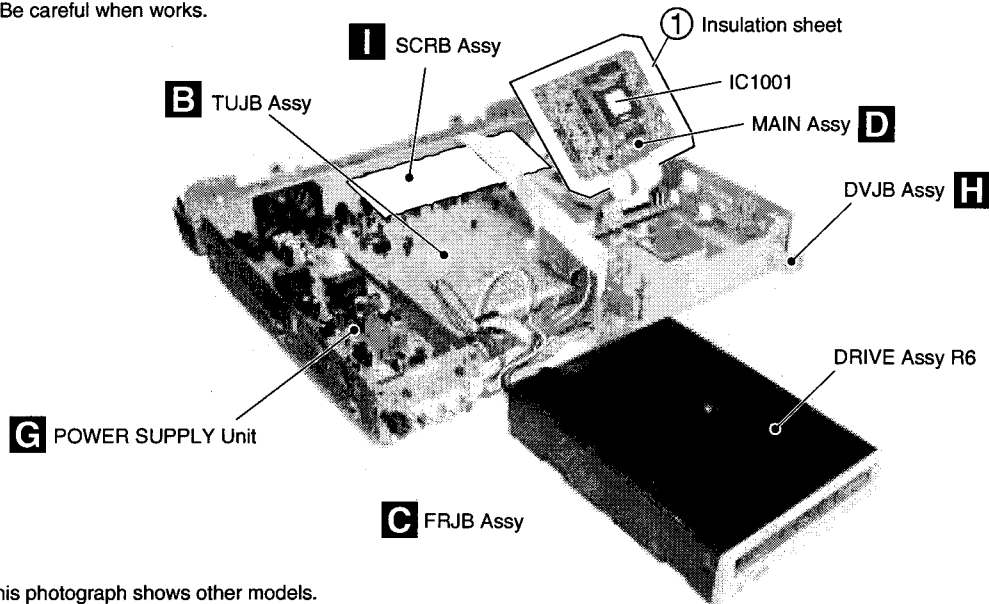
Note: This photograph shows other models.
However, the work method is the same.



6 Diagnosis

- ① Insert the insulation sheet between the MAIN Assy and chassis.
- ② Arrange the unit as shown in the photo below.

Caution: MAIN IC (IC1001) on the MAIN Assy generate heat to around 80 degrees.
Be careful when works.

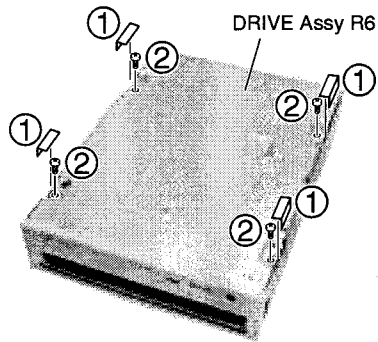


Note: This photograph shows other models.
However, the work method is the same.

7 DRIVE Assy R6 (DVD-R/RW WRITER)

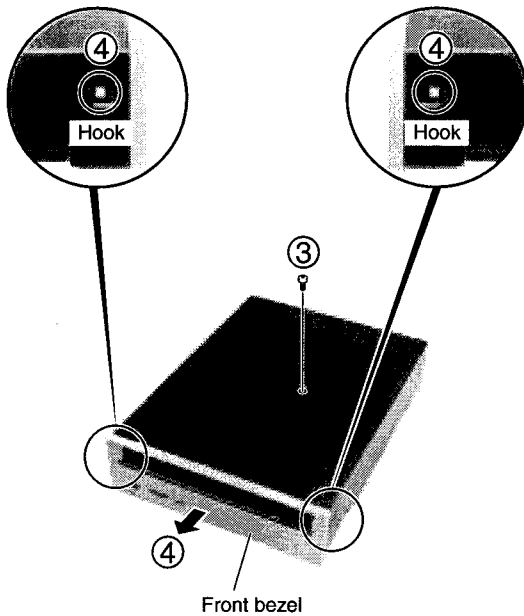
① Remove the four aluminium tape.

② Remove the four screws.

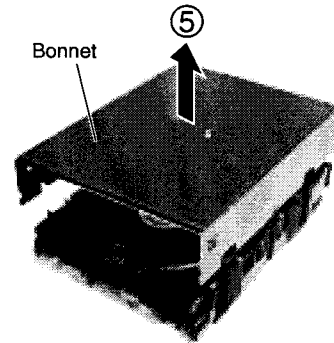


③ Remove the one screw.

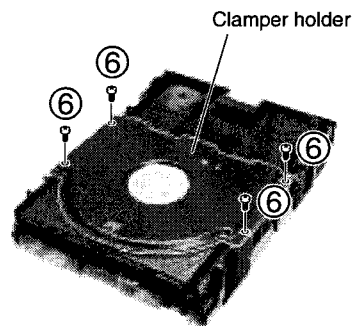
④ Remove the front bezel by removing the two hooks.



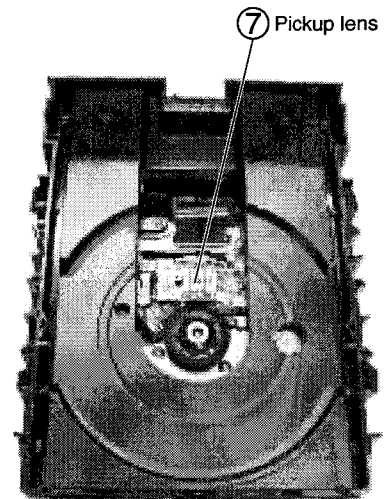
⑤ Remove the bonnet.



⑥ Remove the clamper holder by removing the four screws.



⑦ Clean the pickup lens.



7.2 IC

- The information shown in the list is basic information and may not correspond exactly to that shown in the schematic diagrams.

• List of IC

PD5947A8, RS5C372A, LC75342M, AK5381VT, PST3428U, PST3809U, NJM2880U1-33, M65672WG-C, UPD72852AGB-8EU, UPD72893AGD-LML, TDA9818TS, LA73026AV

■ PD5947A8 (TUJB ASSY : IC2001)

- TUFL Microcomputer

• Pin Function

| No. | Pin Name | Signal Name | I/O | Function | Active |
|-----|--------------------------|-------------|-----|--|--------|
| 1 | P95/ANEX0/CLK4 | FLCLK | O | FL Driver communication line CLK | — |
| 2 | P94/DA1/TB4in | SYNC | I | C-Sync of input video | ↑ |
| 3 | P93/DA0/TB3in | AVLINKIN | I | Input line of NexTVViewLink | — |
| 4 | P92/TB2in/Sout3 | IR | I | Pulse input of remote control | — |
| 5 | P91/TB1in/Sin3 | J_CLOCK | I | | |
| 6 | P90/TB0in/CLK3 | SYNCAFT | I | C-Sync of input video | ↑ |
| 7 | BYTE | BYTE | I | | |
| 8 | CNVss | PGM | I | Communication line | |
| 9 | P87/XCin | NC | (O) | | — |
| 10 | P86/XCout | NC | (O) | | — |
| 11 | -RESET | XRESETIN | I | u-Con Reset | |
| 12 | Xout | XOUT | I | | |
| 13 | Vss | GND | — | | |
| 14 | Xin | XIN | I | | |
| 15 | Vcc | VCC | — | | |
| 16 | P85/-NMI | NMI | I | | ↓ |
| 17 | P84/-INT2 | JOGA | I | Phase VOL input | ↑↓ |
| 18 | P83/-INT1 | SLICEONFB | I | Feedback from SLICEON pin | ↑? |
| 19 | P82/-INT0 | XINTRA | I | Alarm/interval interruption | ↓ |
| 20 | P81/TA4in | NC | (O) | | — |
| 21 | P80/TA4out | NC | (O) | | — |
| 22 | P77/TA3in | NC | (O) | | — |
| 23 | P76/TA3out | FANPWM | O | FAN power control | H |
| 24 | P75/TA2in | JOGB | I | Phase VOL input | ↑↓ |
| 25 | P74/TA2out | NC | (O) | | — |
| 26 | P73/-CTS2/-RTS2/TA1in | IICRST | O | Reset output to I2C microcomputer | L |
| 27 | P72/CLK2/TA1out | AVLINKOUT | O | Output line of NextViewLink | H |
| 28 | P71/RxD2/SCL/TA0in/TB5in | SCL | I/O | I2C communication (clock) | — |
| 29 | P70/TxD2/SDA/TA0out | SDA | I/O | I2C communication (data) | — |
| 30 | Vss2 | GND | — | | |
| 31 | LP2 | LP2 | O | | |
| 32 | LP3 | LP3 | O | | |
| 33 | LP4 | LP4 | O | | |
| 34 | Vdd2 | VDD2 | — | | |
| 35 | M2 | M2 | I | Mode switch | |
| 36 | M1 | M1 | I | | |
| 37 | P11/SLICEON | SLICEON | O | Slicer operating signal | H? |
| 38 | P67/TxD1 | TXD | O | Communication line for firmware download/monitor | — |
| 39 | P66/RxD1 | RXD | I | Communication line for firmware download/monitor | — |
| 40 | P65/CLK1 | SCLK | (O) | Communication line for firmware download/monitor | — |

| No. | Pin Name | Signal Name | I/O | Function | Active |
|-----|-----------------------|-------------|-----|--|--------|
| 41 | P64/-CTS1/-RTS1/CLKS1 | BUSY | O | Communication line for firmware download/monitor | - |
| 42 | P63/TxD0 | SSTOM | O | SYS controller communication line (Tuner → Main) | - |
| 43 | P62/RxD0 | SSMTOT | I | SYS controller communication line (Main → Tuner) | - |
| 44 | P61/CLK0 | SCK | I | SYS controller communication line (clock) | ↑ |
| 45 | P60/-CTS0/-RTS0 | HSTTOM | O | Tuner → SYS handshake | L |
| 46 | P57/-RDY/CLKout | DLCONT | O | Voltage supply SW of FLASH-ROM writing | L |
| 47 | P56/ALE | WRT | O | Write signal | H |
| 48 | P55/-HOLD | SDAEEP | I/O | SDA line for EEPROM | - |
| 49 | P54/-HLDA | SCLEEP | O | SCL line for EEPROM | - |
| 50 | P53/BCLK | VOLCE | O | Communication line CE | H |
| 51 | P52/-RD | VOLDATA | O | Communication line DATA | - |
| 52 | P51/-WRH/-BHE | VOLCLK | O | Communication line CLK | - |
| 53 | P50/-WRL/-WR | DLCE | I | Signal for serial I/O mode selection | - |
| 54 | P47/-CS3 | S1 | O | | |
| 55 | P46/-CS2 | LET | O | Letterbox signal add | H |
| 56 | P45/-CS1 | SQU | O | Squeeze signal add | - |
| 57 | P44/-CS0 | BLANK | I | BLANK signal input | - |
| 58 | P43/A19 | XTHROU | O | Through control of SCART1/2 | L |
| 59 | P42/A18 | NC | (O) | | - |
| 60 | P41/A17 | SEL1 | O | Parallel control (for audio switch) | - |
| 61 | P40/A16 | SWVION | O | Independent source SW for video I/O output circuit | H |
| 62 | P37/A15 | SWSTBY | O | Standby mode of video input selector | H |
| 63 | P36/A14 | BS15ON | O | | |
| 64 | P35/A13 | BS15SRT | I | | |
| 65 | P34/A12 | SCTHRU | O | SCART loop through control during power OFF | L |
| 66 | P33/A11 | BS15IN | I | | |
| 67 | P32/A10 | SDET3 | I | S terminal detection of Video input 3 | L |
| 68 | P31/A9 | SDET2 | I | S terminal detection of Video input 2 | L |
| 69 | Vcc | VCC | - | | |
| 70 | P30/A8 | SDET1 | I | S terminal detection of Video input 1 | L |
| 71 | Vss | GND | - | | |
| 72 | P27/A7 | SELV1 | O | Parallel control | - |
| 73 | P26/A6 | SELV2 | O | Parallel control | - |
| 74 | P25/A5 | SELV3 | O | Parallel control | - |
| 75 | P24/A4 | YVSEL | O | CVBS/YC switch of Video input selector | - |
| 76 | P23/A3 | P_SAVEBS | O | RF through output switch | H |
| 77 | P22/A2 | FOMO | O | | - |
| 78 | P21/A1 | M1ONTA | O | | - |
| 79 | P20/A0 | P_CONT | O | System Power ON | H |
| 80 | P17/D15/-INT5 | NC | (O) | | - |

A

B

C

D

E

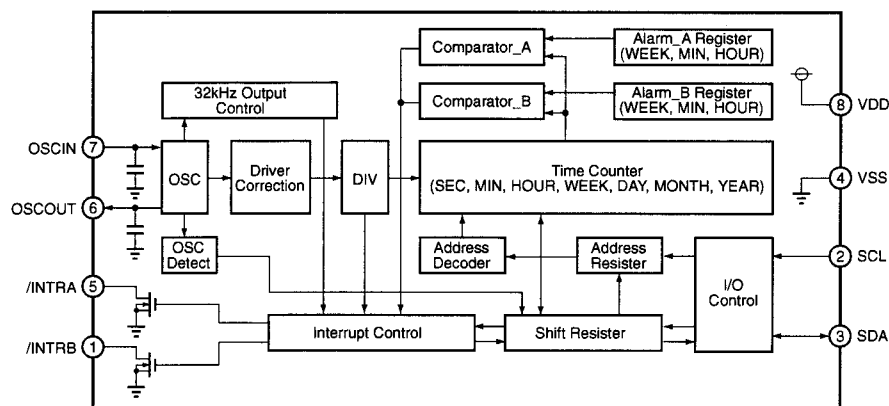
F

| No. | Pin Name | Signal Name | I/O | Function | Active |
|-----|-----------------|-------------|--------|--|--------|
| 81 | P16/D14/-INT4 | HSMTOT | I | SYS → Tuner handshake | ↓ |
| 82 | P15/D13/-INT3 | DCTRI | I | Change detection of audio condition | ↑ |
| 83 | P14/D12 | MUTE | O | MUTE control | H |
| 84 | P13/D11 | SU/SAPID | I | | |
| 85 | P12/D10 | ST/STID | I | | |
| 86 | P11/D9 | XRESET | O | System Reset output | L |
| 87 | P10/D8 | LDASH | O | ColorSystem distinction signal | H |
| 88 | P07/D7 | STBYQ | O | EU multiplex decoder standby mode | L |
| 89 | P06/D6 | LM/ | O | ColorSystem distinction signal | H |
| 90 | P05/D5 | I/BG | O | ColorSystem distinction signal | H |
| 91 | P04/D4 | XP_SAVE | O | Power save control (SCART) | L |
| 92 | P03/D3 | TUON | O | Tuner power | H |
| 93 | P02/D2 | YCSW | O | | |
| 94 | P01/D1 | RSTCTL | O | Reset signal mask from the system controller | L |
| 95 | P00/D0 | FLPON | O | FL Driver Power ON | H |
| 96 | P107/AN7/-KI3 | MODEL1 | A/D IN | Input for destination judgment | — |
| 97 | P106/AN6/-KI2 | MODEL2 | A/D IN | Input for destination judgment | — |
| 98 | P105/AN5/-KI1 | AGC | A/D IN | Field intensity detection | — |
| 99 | P104/AN4/-KI0 | FUNC | A/D IN | Function signal input | — |
| 100 | P103/AN3 | KEY2 | A/D IN | Main unit key input | — |
| 101 | P102/AN2 | KEY1 | A/D IN | Main unit key input | — |
| 102 | P101/AN1 | C/N | A/D IN | | — |
| 103 | Avss | GND | — | | |
| 104 | P100/AN0 | AFT | A/D IN | AFT voltage input | — |
| 105 | VREF | VREF | — | | |
| 106 | AVcc | AVCC | — | | |
| 107 | P97/-ADTRG/Sin4 | FLSTB | O | Communication line strobe of FL driver | L |
| 108 | Vdd1 | VDD1 | — | | |
| 109 | SYNCIN | SYNCTEXT | I | Video input for sync. sep. | |
| 110 | SVREF | SLICE | I | Slice level input | |
| 111 | Vss1 | GND | — | | |
| 112 | Vdd3 | VDD3 | — | | |
| 113 | CVIN1 | CVIN1 | I | Video input for teletext | |
| 114 | Vss3 | GND | — | | |
| 115 | FSCIN | FSCIN | I | Fsc input | |
| 116 | P96/ANEX1/Sout4 | FLDATA | O | Communication line data of FL driver | — |

■ RS5C372A (TUJB ASSY : IC2271)

• Real Time Clock IC

● Block Diagram



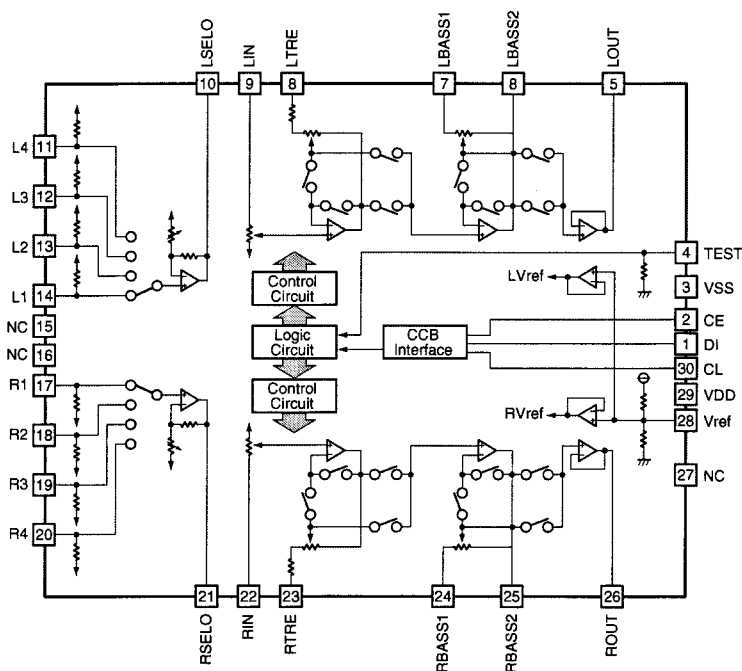
● Pin Function

| No. | Pin Name | I/O | Function | |
|-----|----------|-----|---|--|
| 1 | /INTRB | O | Interruption output B The output of 32.768kHz (in 32768Hz crystal use), cycled interrupt for CPU, or output alarm interrupt (ALARM_B). This pin output 32.768kHz when activated power from 0V. Nch open drain output. | |
| 2 | SCL | I | Shift clock input Synchronize with this clock, and input and output data from a SDA terminal. Exceed VDD, and can input to 6V. | |
| 3 | SDA | I/O | Serial input and output Synchronize with SCL, and input and output writing data or readout data. Exceed VDD, and can input to 6V. Nch open drain output in the output. | |
| 4 | VSS | – | Ground pin | |
| 5 | /INTRA | O | Interruption output A Cycled interrupt for CPU, or output alarm interruption (ALARM_A, ALARM_B). This pin becomes an OFF state when activated power from 0V. N ch open drain output. | |
| 6 | OSCOUT | O | Oscillation circuit output | Connect a crystal resonator of 32.768kHz or 32.000kHz between OSCIN and OSCOUT, and constitute oscillation circuit. (component parts of oscillation circuit except crystal resonator have it built-in.) |
| 7 | OSCIN | I | Oscillation circuit input | |
| 8 | VDD | – | Positive supply input | |

LC75342M (TUJB ASSY : IC2801)

• Electric Volume IC

• Block Diagram



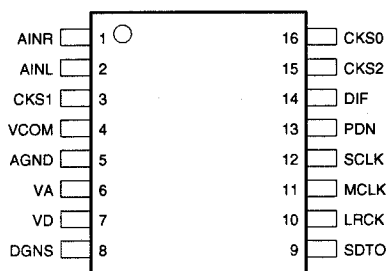
• Pin Function

| No. | Pin Name | Function | No. | Pin Name | Function |
|-----|----------|---|-----|----------|--|
| 1 | DI | Serial data input for control | 16 | NC | Not connected |
| 2 | CE | Chip enable pin Data are written in the internal latch by a timing of "H" → "L", and each analog switch works. Data transfer is enabled by "H" level. | 17 | R1 | Input signal pin |
| 3 | VSS | Ground pin | 18 | R2 | |
| 4 | TEST | Pin for electronic volume test Set to VSS electric potential. | 19 | R3 | |
| 5 | LOUT | Volume and equalizer output pin | 20 | R4 | |
| 6 | LBASS2 | Capacitor and resistor connection pins for bus bandpass filter | 21 | RSELO | Input selector output pin |
| 7 | LBASS1 | Capacitor connection pin for treble bandpass filter | 22 | RIN | Volume and equalizer input pin |
| 8 | LTRE | | 23 | RTRE | Capacitor connection pin for treble bandpass filter |
| 9 | LIN | Volume and equalizer input pin | 24 | RBASS1 | Capacitor and resistor connection pins for bus bandpass filter |
| 10 | LSELO | Input selector output pin | 25 | RBASS2 | |
| 11 | L4 | Input signal pins | 26 | ROUT | Volume and equalizer output pin |
| 12 | L3 | | 27 | NC | Not connected |
| 13 | L2 | | 28 | Vref | 0.5XVDD voltage generation block |
| 14 | L1 | | 29 | VDD | Power supply pin |
| 15 | NC | Not connected | 30 | CL | Clock input pin for control |

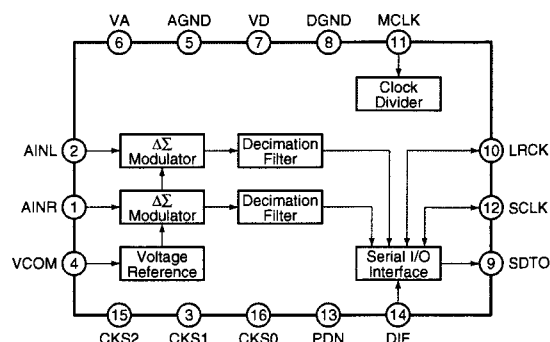
■ AK5381VT (MAIN ASSY : IC3101)

• 96kHz 24 bit $\Delta\Sigma$ ADC

● Pin Arrangement (Top view)



● Block Diagram



● Pin Function

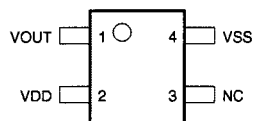
| No. | Pin Name | I/O | Function |
|-----|----------|-----|---|
| 1 | AINR | I | R ch analog input |
| 2 | AINL | I | L ch analog input |
| 3 | CKS1 | I | Mode select 1 |
| 4 | VCOM | O | Common voltage output, bias voltage of VA/2 and ADC input |
| 5 | AGND | - | Analog ground |
| 6 | VA | - | Analog power supply, 4.5V to 5.5V |
| 7 | VD | - | Digital power supply, 2.7 to 5.5V (fs = 4k to 48kHz), 3.0 to 5.5V (fs = 48k to 96kHz) |
| 8 | DGND | - | Digital ground |
| 9 | SDTO | O | Audio serial data output, outputs "L" in the power down mode. |
| 10 | LRCK | I/O | Channel clock I/O, outputs "L" by master mode in the power down mode. |
| 11 | MCLK | I | Master clock input |
| 12 | SCLK | I/O | Audio serial data clock, outputs "L" by master mode in the power down mode. |
| 13 | PDN | I | Power down mode "H": power up, "L": power down |
| 14 | DIF | I | Audio interface format, "H" : 24 bit I2S compatibility, "L" : 24 bit MSB justify |
| 15 | CKS2 | I | Mode select 2 |
| 16 | CKS0 | I | Mode select 0 |

■ PST3428U (MAIN ASSY : IC4003)

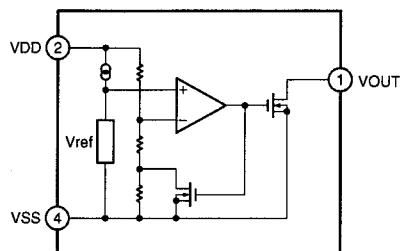
• Reset IC

A

● Pin Arrangement (Top view)



● Block Diagram



B

● Pin Function

| No. | Pin Name | Function |
|-----|----------|----------------------------------|
| 1 | VOUT | Reset signal output |
| 2 | VDD | Power supply / voltage detection |
| 3 | NC | Not connected |
| 4 | VSS | VSS |

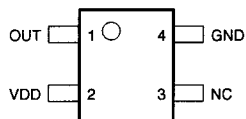
C

■ PST3809U (MAIN ASSY : IC4005)

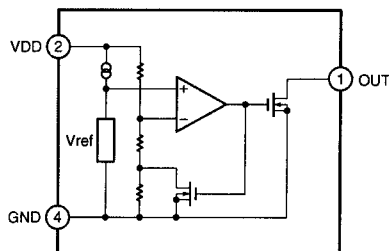
• Reset IC

D

● Pin Arrangement (Top view)



● Block Diagram



E

● Pin Function

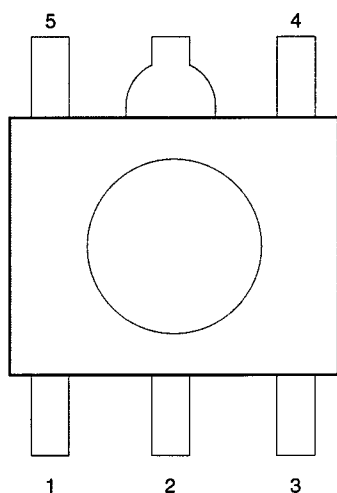
| No. | Pin Name | Function |
|-----|----------|----------------------------------|
| 1 | OUT | Reset signal output |
| 2 | VDD | Power supply / voltage detection |
| 3 | NC | Not connected |
| 4 | GND | Ground |

F

■ NJM2880U1-33 (MAIN ASSY : IC4007)

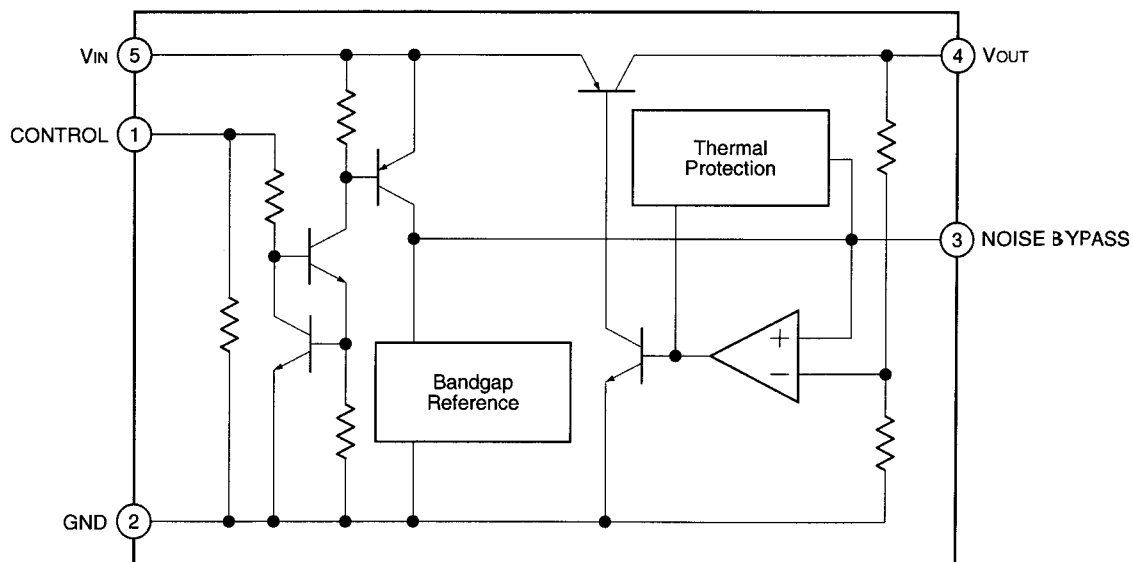
• Regulator IC

● Pin Arrangement (Top view)



- 1 : CONTROL (Active High)
- 2 : GND
- 3 : NOISE BYPASS
- 4 : V_{OUT}
- 5 : V_{IN}

● Block Diagram



M65672WG-C (MAIN ASSY : IC1001)

• Signal Processing IC for DVD Recorder

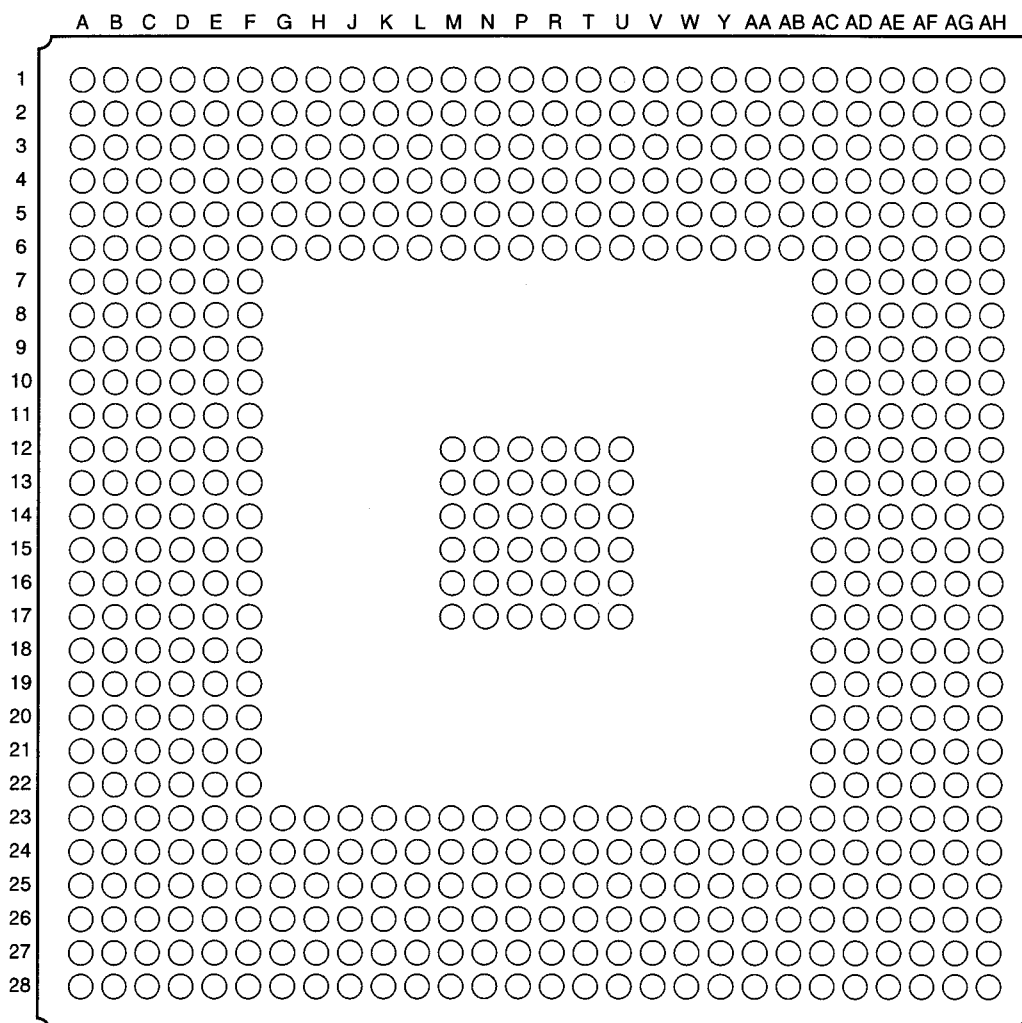
A

• Pin Arrangement (Top view)

B

C

D



E

F

• I/O buffer list

| Buffer Name | Main Function | Remarks |
|---------------|---------------------------------------|--------------|
| PDIDGZ | Input buffer (5V tolerant) | |
| PDUDGZ | Input buffer (5V tolerant), pull-up | |
| PDDDGZ | Input buffer (5V tolerant), pull-down | |
| PDO04CDG | Output buffer, 4mA | |
| PDO08CDG | Output buffer, 8mA | |
| PDO0204DGZ | Output buffer, 2/4mA | |
| PDO0406DSGZ | Output buffer, 4/6mA | For SDRAM IF |
| PDO0406DSGZ×2 | Output buffer, 8/12mA | For SDRAM IF |
| PDT0204DGZ | 3 state output buffer, 2/4mA | |
| PDB04DGZ | Bidirectional buffer, 4mA | |
| PDB08DGZ | Bidirectional buffer, 8mA | |
| PDB0204DGZ | Bidirectional buffer, 2/4mA | |
| PDB0406DSGZ | Bidirectional buffer, 4/6mA | For SDRAM IF |

- **Pin Name list**

[illegible]

| | |
|------|---------------------|
| VDD | : 1.2V Power supply |
| VDD3 | : 3.3V Power supply |
| GND | : Ground |

● Pin Function

| No. | BALL Address | Pin Name | I/O | Function | No. | BALL Address | Pin Name | I/O | Function |
|-----|--------------|-----------|-----|------------------------------|-----|--------------|-----------|-----|---------------------------------|
| 1 | VDD3 | VDD3 | – | 3.3V I/O power supply | 56 | V26 | VRT10 | – | VIDEO-Analog |
| 2 | GND | GND | – | Ground | 57 | V28 | VRM10 | – | VIDEO-Analog |
| 3 | VDD | VDD | – | 1.2V LOGIC power supply | 58 | U25 | VRB10 | – | VIDEO-Analog |
| 4 | AH28 | VDD | – | 1.2V LOGIC power supply | 59 | U26 | VRBD10 | – | VIDEO-Analog |
| 5 | AF26 | ACCCTL | O | | 60 | U27 | DVSSAD10 | – | |
| 6 | AF27 | PEDCTL | O | VIDEO-Analog, Output buffer | 61 | T24 | DVDDAD10 | – | |
| 7 | AG28 | HKEYPLS | O | VIDEO-Analog, Output buffer | 62 | GND | GND | – | Ground |
| 8 | GND | GND | – | Ground | 63 | VDD | VDD | – | 1.2V LOGIC power supply |
| 9 | AE26 | WM1DTI[7] | I/O | WM/VWM, Bidirectional buffer | 64 | U28 | AVDDAD8 | – | |
| 10 | AD25 | WM1DTI[6] | I/O | WM/VWM, Bidirectional buffer | 65 | T25 | AVSSAD8 | – | |
| 11 | AC24 | WM1DTI[5] | I/O | WM/VWM, Bidirectional buffer | 66 | T26 | CIN | I | VIDEO-Analog |
| 12 | AE27 | WM1DTI[4] | I/O | WM/VWM, Bidirectional buffer | 67 | T27 | VRT8 | – | VIDEO-Analog |
| 13 | AF28 | WM1DTI[3] | I/O | WM/VWM, Bidirectional buffer | 68 | T28 | VRB8 | – | VIDEO-Analog |
| 14 | AD26 | WM1DTI[2] | I/O | WM/VWM, Bidirectional buffer | 69 | R25 | AVDDAD8 | – | |
| 15 | AE28 | WM1DTI[1] | I/O | WM/VWM, Bidirectional buffer | 70 | R24 | AVSSAD8 | – | |
| 16 | AC25 | WM1DTI[0] | I/O | WM/VWM, Bidirectional buffer | 71 | R26 | CRIN | I | VIDEO-Analog |
| 17 | AB24 | WM1DTO[7] | I/O | WM/VWM, Bidirectional buffer | 72 | R28 | BG8 | – | VIDEO-Analog |
| 18 | VDD | VDD | – | 1.2V LOGIC power supply | 73 | P28 | AVDDAD8 | – | |
| 19 | GND | GND | – | Ground | 74 | P27 | AVSSAD8 | – | |
| 20 | AD27 | WM1DTO[6] | I/O | WM/VWM, Bidirectional buffer | 75 | R27 | GIN | I | VIDEO-Analog |
| 21 | AC26 | WM1DTO[5] | I/O | WM/VWM, Bidirectional buffer | 76 | P26 | DVSSAD8 | – | |
| 22 | AD28 | WM1DTO[4] | I/O | WM/VWM, Bidirectional buffer | 77 | P25 | DVDDAD8 | – | |
| 23 | AA24 | WM1DTO[3] | I/O | WM/VWM, Bidirectional buffer | 78 | GND | GND | – | Ground |
| 24 | AB25 | WM1DTO[2] | I/O | WM/VWM, Bidirectional buffer | 79 | P24 | EDATA[15] | I/O | SDRAM ENC, Bidirectional buffer |
| 25 | VDD | VDD | – | 1.2V LOGIC power supply | 80 | VDD3 | VDD3 | – | 3.3V I/O power supply |
| 26 | AC27 | WM1DTO[1] | I/O | WM/VWM, Bidirectional buffer | 81 | N28 | EDATA[0] | I/O | SDRAM ENC, Bidirectional buffer |
| 27 | GND | GND | – | Ground | 82 | N27 | EDATA[1] | I/O | SDRAM ENC, Bidirectional buffer |
| 28 | AC28 | WMCLKO | O | WM/VWM, Output buffer | 83 | N26 | EDATA[2] | I/O | SDRAM ENC, Bidirectional buffer |
| 29 | VDD3 | VDD3 | – | 3.3V I/O power supply | 84 | VDD | VDD | – | 1.2V LOGIC power supply |
| 30 | AB26 | WM1DTO[0] | I/O | WM/VWM, Bidirectional buffer | 85 | N25 | EDATA[13] | I/O | SDRAM ENC, Bidirectional buffer |
| 31 | AA25 | WM2DTO[7] | O | WM/VWM, Output buffer | 86 | GND | GND | – | Ground |
| 32 | AB27 | WM2DTO[6] | O | WM/VWM, Output buffer | 87 | M28 | EDATA[3] | I/O | SDRAM ENC, Bidirectional buffer |
| 33 | AB28 | VDD | – | 1.2V LOGIC power supply | 88 | GND | GND | – | Ground |
| 34 | Y24 | WM2DTO[5] | O | WM/VWM, Output buffer | 89 | N24 | EDATA[14] | I/O | SDRAM ENC, Bidirectional buffer |
| 35 | AA27 | WM2DTO[4] | O | WM/VWM, Output buffer | 90 | M27 | EDATA[4] | I/O | SDRAM ENC, Bidirectional buffer |
| 36 | AA26 | WM2DTO[3] | O | WM/VWM, Output buffer | 91 | M26 | EDATA[5] | I/O | SDRAM ENC, Bidirectional buffer |
| 37 | AA28 | WM2DTO[2] | O | WM/VWM, Output buffer | 92 | VDD3 | VDD3 | – | 3.3V I/O power supply |
| 38 | W24 | WM2DTO[1] | O | WM/VWM, Output buffer | 93 | M25 | EDATA[11] | I/O | SDRAM ENC, Bidirectional buffer |
| 39 | GND | GND | – | Ground | 94 | L28 | EDATA[6] | I/O | SDRAM ENC, Bidirectional buffer |
| 40 | Y25 | WM2DTO[0] | O | WM/VWM, Output buffer | 95 | L27 | EDATA[7] | I/O | SDRAM ENC, Bidirectional buffer |
| 41 | GND | GND | – | Ground | 96 | VDD | VDD | – | 1.2V LOGIC power supply |
| 42 | Y26 | SYNC | I/O | TS OUT, Bidirectional buffer | 97 | M24 | EDATA[12] | I/O | SDRAM ENC, Bidirectional buffer |
| 43 | Y27 | STREAM | I/O | TS OUT, Bidirectional buffer | 98 | GND | GND | – | Ground |
| 44 | Y28 | PACKETEN | I/O | TS OUT, Bidirectional buffer | 99 | L26 | EDATA[8] | I/O | SDRAM ENC, Bidirectional buffer |
| 45 | VDD3 | VDD3 | – | 3.3V IO power supply | 100 | GND | GND | – | Ground |
| 46 | W25 | TSRW | O | TS OUT, Output buffer | 101 | L25 | EDATA[9] | I/O | SDRAM ENC, Bidirectional buffer |
| 47 | GND | GND | – | Ground | 102 | K28 | EDQM | O | SDRAM ENC, Output buffer |
| 48 | V24 | TSCLK | O | TS OUT, Output buffer | 103 | K27 | EWE | O | SDRAM ENC, Output buffer |
| 49 | VDD3 | VDD3 | – | 3.3V I/O power supply | 104 | VDD3 | VDD3 | – | 3.3V I/O power supply |
| 50 | W26 | NBC10 | – | VIDEO-Analog | 105 | K26 | ECAS | O | SDRAM ENC, Output buffer |
| 51 | W27 | VBGR10 | – | VIDEO-Analog | 106 | L24 | EDATA[10] | I/O | SDRAM ENC, Bidirectional buffer |
| 52 | W28 | AVDDAD10 | – | | 107 | K25 | ECLKEN | O | Output buffer, 4/6mA |
| 53 | V25 | AVSSAD10 | – | | 108 | VDD | VDD | – | 1.2V LOGIC power supply |
| 54 | V27 | CVBSIN | I | VIDEO-Analog | 109 | J28 | ERAS | O | SDRAM ENC, Output buffer |
| 55 | U24 | VRTD10 | – | VIDEO-Analog | 110 | GND | GND | – | Ground |

| No. | BALL Address | Pin Name | I/O | Function | No. | BALL Address | Pin Name | I/O | Function |
|-----|--------------|-------------|-----|---------------------------------|-----|--------------|-------------|-----|---------------------------------|
| 111 | J27 | ECS | O | SDRAM ENC, Output buffer | 166 | VDD3 | VDD3 | – | 3.3V I/O power supply |
| 112 | GND | GND | – | Ground | 167 | C25 | AT1DATA[11] | I/O | ATAPI-DVD, Bidirectional buffer |
| 113 | J26 | EADRS[11] | O | SDRAM ENC, Output buffer | 168 | D24 | AT1DATA[10] | I/O | ATAPI-DVD, Bidirectional buffer |
| 114 | J25 | EADRS[8] | O | SDRAM ENC, Output buffer | 169 | E23 | AT1DATA[9] | I/O | ATAPI-DVD, Bidirectional buffer |
| 115 | GND | GND | – | Ground | 170 | GND | GND | – | Ground |
| 116 | K24 | ECLKO | O | SDRAM ENC, Output buffer | 171 | A26 | AT1DATA[8] | I/O | ATAPI-DVD, Bidirectional buffer |
| 117 | VDD3 | VDD3 | – | 3.3V I/O power supply | 172 | A25 | AT1DATA[7] | I/O | ATAPI-DVD, Bidirectional buffer |
| 118 | H28 | EBS[0] | O | SDRAM ENC, Output buffer | 173 | B25 | AT1DATA[6] | I/O | ATAPI-DVD, Bidirectional buffer |
| 119 | H27 | EBS[1] | O | SDRAM ENC, Output buffer | 174 | GND | GND | – | Ground |
| 120 | H26 | EADRS[10] | O | SDRAM ENC, Output buffer | 175 | C24 | AT1DATA[5] | I/O | ATAPI-DVD, Bidirectional buffer |
| 121 | VDD | VDD | – | 1.2V LOGIC power supply | 176 | VDD3 | VDD3 | – | 3.3V I/O power supply |
| 122 | G28 | EADRS[0] | O | SDRAM ENC, Output buffer | 177 | E22 | AT1DATA[4] | I/O | ATAPI-DVD, Bidirectional buffer |
| 123 | GND | GND | – | Ground | 178 | VDD | VDD | – | 1.2V LOGIC power supply |
| 124 | J24 | EADRS[9] | O | SDRAM ENC, Output buffer | 179 | D23 | AT1DATA[3] | I/O | ATAPI-DVD, Bidirectional buffer |
| 125 | GND | GND | – | Ground | 180 | A24 | AT1DATA[2] | I/O | ATAPI-DVD, Bidirectional buffer |
| 126 | G27 | EADRS[1] | O | SDRAM ENC, Output buffer | 181 | B24 | AT1DATA[1] | I/O | ATAPI-DVD, Bidirectional buffer |
| 127 | H25 | EADRS[6] | O | SDRAM ENC, Output buffer | 182 | GND | GND | – | Ground |
| 128 | G26 | EADRS[2] | O | SDRAM ENC, Output buffer | 183 | C23 | AT1DATA[0] | I/O | ATAPI-DVD, Bidirectional buffer |
| 129 | VDD3 | VDD3 | – | 3.3V I/O power supply | 184 | D22 | AT1RESET | O | Output buffer, 8mA |
| 130 | F27 | EDATA[17] | I/O | SDRAM ENC, Bidirectional buffer | 185 | E21 | AT1DMARQ | I | ATAPI-DVD, Input buffer |
| 131 | F28 | EDATA[16] | I/O | SDRAM ENC, Bidirectional buffer | 186 | GND | GND | – | Ground |
| 132 | H24 | EADRS[7] | O | SDRAM ENC, Output buffer | 187 | B23 | AT1DMACK | O | ATAPI-DVD, Output buffer |
| 133 | VDD | VDD | – | 1.2V LOGIC power supply | 188 | VDD3 | VDD3 | – | 3.3V I/O power supply |
| 134 | G25 | EADRS[4] | O | SDRAM ENC, Output buffer | 189 | A23 | AT1DIOW | O | ATAPI-DVD, Output buffer |
| 135 | GND | GND | – | Ground | 190 | VDD | VDD | – | 1.2V LOGIC power supply |
| 136 | F26 | EDATA[30] | I/O | SDRAM ENC, Bidirectional buffer | 191 | C22 | AT1DIOR | O | ATAPI-DVD, Output buffer |
| 137 | GND | GND | – | Ground | 192 | D21 | AT1IORDY | I | ATAPI-DVD, Input buffer |
| 138 | E27 | EDATA[19] | I/O | SDRAM ENC, Bidirectional buffer | 193 | B22 | AT1INTRQ | I | ATAPI-DVD, Input buffer |
| 139 | E28 | EDATA[18] | I/O | SDRAM ENC, Bidirectional buffer | 194 | GND | GND | – | Ground |
| 140 | F25 | EDATA[31] | I/O | SDRAM ENC, Bidirectional buffer | 195 | E20 | AT1ADR[2] | O | ATAPI-DVD, Output buffer |
| 141 | VDD3 | VDD3 | – | 3.3V I/O power supply | 196 | A22 | AT1ADR[1] | O | ATAPI-DVD, Output buffer |
| 142 | E26 | EDATA[29] | I/O | SDRAM ENC, Bidirectional buffer | 197 | C21 | AT1ADR[0] | O | ATAPI-DVD, Output buffer |
| 143 | G24 | EADRS[5] | O | SDRAM ENC, Output buffer | 198 | GND | GND | – | Ground |
| 144 | D28 | EDATA[20] | I/O | SDRAM ENC, Bidirectional buffer | 199 | B21 | AT1CS[1] | O | ATAPI-DVD, Output buffer |
| 145 | VDD | VDD | – | 1.2V LOGIC power supply | 200 | VDD3 | VDD3 | – | 3.3V I/O power supply |
| 146 | D27 | EDATA[21] | I/O | SDRAM ENC, Bidirectional buffer | 201 | A21 | AT1CS[0] | O | ATAPI-DVD, Output buffer |
| 147 | GND | GND | – | Ground | 202 | VDD | VDD | – | 1.2V LOGIC power supply |
| 148 | C28 | EDATA[22] | I/O | SDRAM ENC, Bidirectional buffer | 203 | E19 | AT2DATA[15] | I/O | ATAPI-HDD, Bidirectional buffer |
| 149 | GND | GND | – | Ground | 204 | D20 | AT2DATA[14] | I/O | ATAPI-HDD, Bidirectional buffer |
| 150 | F24 | EADRS[3] | O | SDRAM ENC, Output buffer | 205 | C20 | AT2DATA[13] | I/O | ATAPI-HDD, Bidirectional buffer |
| 151 | E25 | EDATA[28] | I/O | SDRAM ENC, Bidirectional buffer | 206 | GND | GND | – | Ground |
| 152 | D26 | EDATA[26] | I/O | SDRAM ENC, Bidirectional buffer | 207 | B20 | AT2DATA[12] | I/O | ATAPI-HDD, Bidirectional buffer |
| 153 | VDD3 | VDD3 | – | 3.3V I/O power supply | 208 | A20 | AT2DATA[11] | I/O | ATAPI-HDD, Bidirectional buffer |
| 154 | B28 | EDATA[23] | I/O | SDRAM ENC, Bidirectional buffer | 209 | D19 | AT2DATA[10] | I/O | ATAPI-HDD, Bidirectional buffer |
| 155 | C27 | EDATA[25] | I/O | SDRAM ENC, Bidirectional buffer | 210 | GND | GND | – | Ground |
| 156 | B27 | EDATA[24] | I/O | SDRAM ENC, Bidirectional buffer | 211 | E18 | AT2DATA[9] | I/O | ATAPI-HDD, idirectional buffer |
| 157 | VDD | VDD | – | 1.2V LOGIC power supply | 212 | VDD3 | VDD3 | – | 3.3V I/O power supply |
| 158 | D25 | EDATA[27] | I/O | SDRAM ENC, Bidirectional buffer | 213 | C19 | AT2DATA[8] | I/O | ATAPI-HDD, Bidirectional buffer |
| 159 | GND | GND | – | Ground | 214 | VDD | VDD | – | 1.2V LOGIC power supply |
| 160 | C26 | AT1DATA[15] | I/O | ATAPI-DVD, Bidirectional buffer | 215 | B19 | AT2DATA[7] | I/O | ATAPI-HDD, Bidirectional buffer |
| 161 | E24 | AT1DATA[14] | I/O | ATAPI-DVD, Bidirectional buffer | 216 | A19 | AT2DATA[6] | I/O | ATAPI-HDD, Bidirectional buffer |
| 162 | GND | GND | – | Ground | 217 | D18 | AT2DATA[5] | I/O | ATAPI-HDD, Bidirectional buffer |
| 163 | A28 | VDD | – | 1.2V LOGIC power supply | 218 | GND | GND | – | Ground |
| 164 | B26 | AT1DATA[13] | I/O | ATAPI-DVD, Bidirectional buffer | 219 | C18 | AT2DATA[4] | I/O | ATAPI-HDD, Bidirectional buffer |
| 165 | A27 | AT1DATA[12] | I/O | ATAPI-DVD, Bidirectional buffer | 220 | E17 | AT2DATA[3] | I/O | ATAPI-HDD, Bidirectional buffer |

A

B

C

D

E

F

| No. | BALL Address | Pin Name | I/O | Function | No. | BALL Address | Pin Name | I/O | Function |
|-----|--------------|------------|-----|---------------------------------|-----|--------------|------------|-----|-----------------------------------|
| 221 | B18 | AT2DATA[2] | I/O | ATAPI-HDD, Bidirectional buffer | 276 | VDD3 | VDD3 | – | 3.3V I/O power supply |
| 222 | GND | GND | – | Ground | 277 | C11 | AMCLK2 | I | CLOCK, Input buffer |
| 223 | A18 | AT2DATA[1] | I/O | ATAPI-HDD, Bidirectional buffer | 278 | GND | GND | – | Ground |
| 224 | VDD3 | VDD3 | – | 3.3V I/O power supply | 279 | D11 | ARDATA[1] | I/O | SDRAM-ATAPI, Bidirectional buffer |
| 225 | D17 | AT2DATA[0] | I/O | ATAPI-HDD, Bidirectional buffer | 280 | VDD3 | VDD3 | – | 3.3V I/O power supply |
| 226 | VDD | VDD | – | 1.2V LOGIC power supply | 281 | A10 | ARDATA[14] | I/O | SDRAM-ATAPI, Bidirectional buffer |
| 227 | C17 | AT2RESET | I/O | ATAPI-HDD, Bidirectional buffer | 282 | VDD | VDD | – | 1.2V LOGIC power supply |
| 228 | B17 | AT2DMARQ | I | ATAPI-HDD, Input buffer | 283 | B10 | ARDATA[15] | I/O | SDRAM-ATAPI, Bidirectional buffer |
| 229 | E16 | AT2DMACK | O | ATAPI-HDD, Output buffer | 284 | E11 | ARDATA[0] | I/O | SDRAM-ATAPI, Bidirectional buffer |
| 230 | GND | GND | – | Ground | 285 | C10 | ARDATA[4] | I/O | SDRAM-ATAPI, Bidirectional buffer |
| 231 | A17 | AT2DIOW | O | ATAPI-HDD, Output buffer | 286 | GND | GND | – | Ground |
| 232 | D16 | AT2DIOR | O | ATAPI-HDD, Output buffer | 287 | D10 | ARDATA[3] | I/O | SDRAM-ATAPI, Bidirectional buffer |
| 233 | C16 | AT2IORDY | I | ATAPI-HDD, Input buffer | 288 | A9 | ARDATA[11] | I/O | SDRAM-ATAPI, Bidirectional buffer |
| 234 | GND | GND | – | Ground | 289 | B9 | ARDATA[12] | I/O | SDRAM-ATAPI, Bidirectional buffer |
| 235 | B16 | AT2INTRQ | I | ATAPI-HDD, Input buffer | 290 | GND | GND | – | Ground |
| 236 | VDD3 | VDD3 | – | 3.3V I/O power supply | 291 | C9 | ARDATA[13] | I/O | SDRAM-ATAPI, Bidirectional buffer |
| 237 | A16 | AT2ADR[2] | I/O | ATAPI-HDD, Bidirectional buffer | 292 | E10 | ARDATA[2] | I/O | SDRAM-ATAPI, Bidirectional buffer |
| 238 | VDD | VDD | – | 1.2V LOGIC power supply | 293 | D9 | ARDATA[6] | I/O | SDRAM-ATAPI, Bidirectional buffer |
| 239 | E15 | AT2ADR[1] | I/O | ATAPI-HDD, Bidirectional buffer | 294 | VDD3 | VDD3 | – | 3.3V I/O power supply |
| 240 | GND | GND | – | Ground | 295 | A8 | ARDATA[10] | I/O | SDRAM-ATAPI, Bidirectional buffer |
| 241 | D15 | AT2ADR[0] | I/O | ATAPI-HDD, Bidirectional buffer | 296 | B8 | ARDATA[9] | I/O | SDRAM-ATAPI, Bidirectional buffer |
| 242 | VDD | VDD | – | 1.2V LOGIC power supply | 297 | C8 | ARWE | O | SDRAM-ATAPI, Output buffer |
| 243 | C15 | AT2CS[1] | O | ATAPI-HDD, Output buffer | 298 | VDD | VDD | – | 1.2V LOGIC power supply |
| 244 | GND | GND | – | Ground | 299 | A7 | ARDATA[8] | I/O | SDRAM-ATAPI, Bidirectional buffer |
| 245 | B15 | AT2CS[0] | O | ATAPI-HDD, Output buffer | 300 | E9 | ARDATA[5] | I/O | SDRAM-ATAPI, Bidirectional buffer |
| 246 | VDD | VDD | – | 1.2V LOGIC power supply | 301 | D8 | ARDQM[0] | O | SDRAM-ATAPI, Output buffer |
| 247 | A15 | AT2MODE | I | ATAPI-HDD, Input buffer | 302 | GND | GND | – | Ground |
| 248 | GND | GND | – | Ground | 303 | B7 | ARDQM[1] | O | SDRAM-ATAPI, Output buffer |
| 249 | GND | GND | – | Ground | 304 | C7 | ARCS[0] | O | SDRAM-ATAPI, Output buffer |
| 250 | A14 | RESET | I | Input buffer (5V tolerant) | 305 | VDD3 | VDD3 | – | 3.3V I/O power supply |
| 251 | VDD3 | VDD3 | – | 3.3V I/O power supply | 306 | A6 | ARCLKO | O | SDRAM-ATAPI, Output buffer |
| 252 | B14 | VDD | – | 1.2V LOGIC power supply | 307 | GND | GND | – | Ground |
| 253 | C14 | DBI | I | TEST, Input buffer | 308 | B6 | ARADRS[12] | O | SDRAM-ATAPI, Output buffer |
| 254 | GND | GND | – | Ground | 309 | E8 | ARDATA[7] | I/O | SDRAM-ATAPI, Bidirectional buffer |
| 255 | D14 | TRACE | I | TEST, Input buffer | 310 | D7 | ARRAS | O | SDRAM-ATAPI, Output buffer |
| 256 | E14 | VDD | – | 1.2V LOGIC power supply | 311 | VDD3 | VDD3 | – | 3.3V I/O power supply |
| 257 | A13 | PCO | O | CLOCK, 3 state output buffer | 312 | A5 | ARADRS[11] | O | SDRAM-ATAPI, Output buffer |
| 258 | GND | GND | – | Ground | 313 | C6 | ARADRS[13] | O | SDRAM-ATAPI, Output buffer |
| 259 | B13 | PLL3AVSS | – | | 314 | B5 | ARADRS[9] | O | SDRAM-ATAPI, Output buffer |
| 260 | C13 | PLL3AVDD | – | | 315 | VDD | VDD | – | 1.2V LOGIC power supply |
| 261 | D13 | VMCLK | I | CLOCK, Input buffer | 316 | E7 | ARCAS | O | SDRAM-ATAPI, Output buffer |
| 262 | E13 | PLL1AVDD | – | | 317 | D6 | ARADRS[14] | O | SDRAM-ATAPI, Output buffer |
| 263 | A12 | PLL1AVSS | – | | 318 | C5 | ARADRS[1] | O | SDRAM-ATAPI, Output buffer |
| 264 | VDD3 | VDD3 | – | 3.3V I/O power supply | 319 | GND | GND | – | Ground |
| 265 | B12 | ADCCLKO | O | CLOCK, Output buffer | 320 | B4 | ARADRS[3] | O | SDRAM-ATAPI, Output buffer |
| 266 | GND | GND | – | Ground | 321 | A4 | ARADRS[8] | O | SDRAM-ATAPI, Output buffer |
| 267 | C12 | VDD | – | 1.2V LOGIC power supply | 322 | A3 | ARADRS[7] | O | SDRAM-ATAPI, Output buffer |
| 268 | VDD3 | VDD3 | – | 3.3V I/O power supply | 323 | GND | GND | – | Ground |
| 269 | D12 | DVAMCLKO | O | CLOCK, Output buffer | 324 | E6 | ARCS[1] | O | SDRAM-ATAPI, Output buffer |
| 270 | GND | GND | – | Ground | 325 | D5 | ARADRS[0] | O | SDRAM-ATAPI, Output buffer |
| 271 | A11 | DACCLKO | O | CLOCK, Output buffer | 326 | C4 | ARADRS[2] | O | SDRAM-ATAPI, Output buffer |
| 272 | VDD3 | VDD3 | – | 3.3V I/O power supply | 327 | VDD3 | VDD3 | – | 3.3V I/O power supply |
| 273 | E12 | DVAMCLKI | I | AUDIO CLOCK, Input buffer | 328 | A2 | ARADRS[5] | O | SDRAM-ATAPI, Output buffer |
| 274 | GND | GND | – | Ground | 329 | B3 | ARADRS[6] | O | SDRAM-ATAPI, Output buffer |
| 275 | B11 | AMCLK1 | I | CLOCK, Input buffer | 330 | B2 | ARADRS[4] | O | SDRAM-ATAPI, Output buffer |

| No. | BALL Address | Pin Name | I/O | Function | No. | BALL Address | Pin Name | I/O | Function |
|-----|--------------|------------|-----|---------------------------------|-----|--------------|-----------|-----|---------------------------------|
| 331 | GND | GND | – | Ground | 386 | VDD | VDD | – | 1.2V LOGIC power supply |
| 332 | E5 | ARADRS[10] | O | SDRAM-ATAPI, Output buffer | 387 | GND | GND | – | Ground |
| 333 | D4 | SRCBCKI | I | AUDIO, Input buffer | 388 | L3 | SPIDATAI | I/O | HOST, Bidirectional buffer |
| 334 | VDD3 | VDD3 | – | 3.3V I/O power supply | 389 | VDD | VDD | – | 1.2V LOGIC power supply |
| 335 | C3 | SRCLRCKI | I | AUDIO, Input buffer | 390 | M5 | SPIDATAO | I/O | HOST, Bidirectional buffer |
| 336 | B1 | SRCDATAI | I | AUDIO, Input buffer | 391 | GND | GND | – | Ground |
| 337 | A1 | VDD | – | 1.2V LOGIC power supply | 392 | L2 | SPICLK | I/O | HOST, Bidirectional buffer |
| 338 | GND | GND | – | Ground | 393 | GND | GND | – | Ground |
| 339 | C2 | SRCBCKO | O | AUDIO, Output buffer | 394 | L1 | DDATA[0] | I/O | SDRAM-DEC, Bidirectional buffer |
| 340 | VDD | VDD | – | 1.2V LOGIC power supply | 395 | VDD3 | VDD3 | – | 3.3V I/O power supply |
| 341 | D3 | SRCLRCKO | O | AUDIO, Output buffer | 396 | M4 | DDATA[14] | I/O | SDRAM-DEC, Bidirectional buffer |
| 342 | E4 | SRCDATAO | O | AUDIO, Output buffer | 397 | M3 | DDATA[15] | I/O | SDRAM-DEC, Bidirectional buffer |
| 343 | F5 | SPDIFI | I | AUDIO, Input buffer | 398 | M2 | DDATA[2] | I/O | SDRAM-DEC, Bidirectional buffer |
| 344 | D2 | SPDIFO | O | AUDIO, Output buffer | 399 | VDD | VDD | – | 1.2V LOGIC power supply |
| 345 | C1 | DVLRCK | I/O | AUDIO, Bidirectional buffer | 400 | N5 | DDATA[11] | I/O | SDRAM-DEC, Bidirectional buffer |
| 346 | E3 | DVBCK | I/O | AUDIO, Bidirectional buffer | 401 | GND | GND | – | Ground |
| 347 | D1 | DVADATA | I/O | AUDIO, Bidirectional buffer | 402 | M1 | DDATA[1] | I/O | SDRAM-DEC, Bidirectional buffer |
| 348 | F4 | ACMOD[1] | I | AUDIO, Input buffer | 403 | GND | GND | – | Ground |
| 349 | G5 | ACMOD[0] | I | AUDIO, Input buffer | 404 | N4 | DDATA[12] | I/O | SDRAM-DEC, Bidirectional buffer |
| 350 | E1 | LRCKI | I | AUDIO, Input buffer | 405 | N3 | DDATA[13] | I/O | SDRAM-DEC, Bidirectional buffer |
| 351 | E2 | BCKI | I | AUDIO, Input buffer | 406 | N2 | DDATA[3] | I/O | SDRAM-DEC, Bidirectional buffer |
| 352 | GND | GND | – | Ground | 407 | VDD3 | VDD3 | – | 3.3V I/O power supply |
| 353 | F3 | ADATAI | I | AUDIO, Input buffer | 408 | N1 | DDATA[4] | I/O | SDRAM-DEC, Bidirectional buffer |
| 354 | GND | GND | – | Ground | 409 | P5 | DDATA[8] | I/O | SDRAM-DEC, Bidirectional buffer |
| 355 | G4 | LRCKO | O | AUDIO, Output buffer | 410 | P4 | DDATA[9] | I/O | SDRAM-DEC, Bidirectional buffer |
| 356 | VDD | VDD | – | 1.2V LOGIC power supply | 411 | VDD | VDD | – | 1.2V LOGIC power supply |
| 357 | H5 | BCKO | O | AUDIO, Output buffer | 412 | P3 | DDATA[10] | I/O | SDRAM-DEC, Bidirectional buffer |
| 358 | F1 | ADATAO | O | DVD-AUDIO, Output buffer | 413 | GND | GND | – | Ground |
| 359 | F2 | DVDADT[7] | O | DVD-AUDIO, Output buffer | 414 | P2 | DDATA[6] | I/O | SDRAM-DEC, Bidirectional buffer |
| 360 | G2 | DVDADT[6] | O | DVD-AUDIO, Output buffer | 415 | GND | GND | – | Ground |
| 361 | G3 | DVDADT[5] | O | DVD-AUDIO, Output buffer | 416 | P1 | DDATA[5] | I/O | SDRAM-DEC, Bidirectional buffer |
| 362 | J5 | DVDADT[4] | O | DVD-AUDIO, Output buffer | 417 | R1 | DDATA[7] | I/O | SDRAM-DEC, Bidirectional buffer |
| 363 | H4 | DVDADT[3] | O | DVD-AUDIO, Output buffer | 418 | R2 | DDQM[0] | O | SDRAM-DEC, Output buffer |
| 364 | G1 | DVDADT[2] | O | DVD-AUDIO, Output buffer | 419 | VDD3 | VDD3 | – | 3.3V I/O power supply |
| 365 | H3 | DVDADT[1] | O | DVD-AUDIO, Output buffer | 420 | R3 | DWE | O | SDRAM-DEC, Output buffer |
| 366 | H2 | DVDADT[0] | O | DVD-AUDIO, Output buffer | 421 | VDD | VDD | – | 1.2V LOGIC power supply |
| 367 | H1 | DVDAADR[1] | O | DVD-AUDIO, Output buffer | 422 | R4 | DDQM[1] | O | SDRAM-DEC, Output buffer |
| 368 | K5 | DVDAADR[0] | O | DVD-AUDIO, Output buffer | 423 | GND | GND | – | Ground |
| 369 | J4 | DVDAREQ | I/O | DVD-AUDIO, Bidirectional buffer | 424 | R5 | DCLKO | O | SDRAM-DEC, Output buffer |
| 370 | GND | GND | – | Ground | 425 | VDD3 | VDD3 | – | 3.3V I/O power supply |
| 371 | J3 | DVDAACK | O | DVD-AUDIO, Output buffer | 426 | VDD | VDD | – | 1.2V LOGIC power supply |
| 372 | VDD | VDD | – | 1.2V LOGIC power supply | 427 | T1 | DCAS | O | SDRAM-DEC, Output buffer |
| 373 | J2 | SCICS[1] | I/O | HOST, Bidirectional buffer | 428 | GND | GND | – | Ground |
| 374 | VDD3 | VDD3 | – | 3.3V I/O power supply | 429 | T2 | DRAS | – | SDRAM-DEC, Output buffer |
| 375 | J1 | SCICS[0] | I/O | HOST, Bidirectional buffer | 430 | GND | GND | – | Ground |
| 376 | VDD | VDD | – | 1.2V LOGIC power supply | 431 | T3 | DCS | O | SDRAM-DEC, Output buffer |
| 377 | K4 | SCIDATA[1] | I/O | HOST, Bidirectional buffer | 432 | T4 | DADRS[11] | O | SDRAM-DEC, Output buffer |
| 378 | GND | GND | – | Ground | 433 | U1 | DBS[0] | O | SDRAM-DEC, Output buffer |
| 379 | L5 | SCIDATA[0] | I/O | HOST, Bidirectional buffer | 434 | VDD3 | VDD3 | – | 3.3V I/O power supply |
| 380 | K3 | VDD | – | 1.2V LOGIC power supply | 435 | T5 | DADRS[9] | O | SDRAM-DEC, Output buffer |
| 381 | K2 | SCICLK[1] | I/O | HOST, Bidirectional buffer | 436 | U2 | DBS[1] | O | SDRAM-DEC, Output buffer |
| 382 | GND | GND | – | Ground | 437 | U3 | DADRS[10] | O | SDRAM-DEC, Output buffer |
| 383 | K1 | SCICLK[0] | I/O | HOST, Bidirectional buffer | 438 | VDD | VDD | – | 1.2V LOGIC power supply |
| 384 | GND | GND | – | Ground | 439 | U4 | DADRS[7] | O | SDRAM-DEC, Output buffer |
| 385 | L4 | SPICS | I/O | HOST, Bidirectional buffer | 440 | GND | GND | – | Ground |

A

B

C

D

E

F

| No. | BALL Address | Pin Name | I/O | Function | No. | BALL Address | Pin Name | I/O | Function |
|-----|--------------|----------|-----|----------------------------|-----|--------------|-----------|-----|----------------------------|
| 441 | V1 | DADRS[0] | O | SDRAM-DEC, Output buffer | 496 | VDD | VDD | - | 1.2V LOGIC power supply |
| 442 | GND | GND | - | Ground | 497 | AD4 | HDACK[0] | O | Output buffer, 4mA |
| 443 | V2 | DADRS[1] | O | SDRAM-DEC, Output buffer | 498 | AF1 | HDREQ[1] | I | HOST, Input buffer |
| 444 | VDD | VDD | - | 1.2V LOGIC power supply | 499 | AE3 | HDREQ[0] | I | HOST, Input buffer |
| 445 | U5 | DADRS[8] | O | SDRAM-DEC, Output buffer | 500 | AC5 | HWAIT | I | HOST, Input buffer |
| 446 | GND | GND | - | Ground | 501 | AF2 | HOE | O | HOST, Output buffer |
| 447 | V3 | DADRS[5] | O | SDRAM-DEC, Output buffer | 502 | VDD3 | VDD3 | - | 3.3V I/O power supply |
| 448 | VDD3 | VDD3 | - | 3.3V I/O power supply | 503 | GND | GND | - | Ground |
| 449 | V4 | DADRS[6] | O | SDRAM-DEC, Output buffer | 504 | AE4 | VDD | - | 1.2V LOGIC power supply |
| 450 | W1 | DADRS[3] | O | SDRAM-DEC, Output buffer | 505 | AD5 | HCS[5] | O | HOST, Output buffer |
| 451 | W2 | DADRS[2] | O | SDRAM-DEC, Output buffer | 506 | AG2 | HCS[4] | O | HOST, Output buffer |
| 452 | VDD | VDD | - | 1.2V LOGIC power supply | 507 | AF3 | HCS[3] | O | HOST, Output buffer |
| 453 | W3 | DADRS[4] | O | SDRAM-DEC, Output buffer | 508 | AG3 | HCS[2] | O | HOST, Output buffer |
| 454 | GND | GND | - | Ground | 509 | AH2 | HCS[1] | O | HOST, Output buffer |
| 455 | GND | GND | - | Ground | 510 | GND | GND | - | Ground |
| 456 | GND | GND | - | Ground | 511 | AF4 | HCS[0] | O | HOST, Output buffer |
| 457 | V5 | INT[7] | I/O | HOST, Bidirectional buffer | 512 | VDD | VDD | - | 1.2V LOGIC power supply |
| 458 | VDD | VDD | - | 1.2V LOGIC power supply | 513 | AD6 | HADRS[10] | I/O | HOST, Bidirectional buffer |
| 459 | W4 | INT[6] | I/O | HOST, Bidirectional buffer | 514 | GND | GND | - | Ground |
| 460 | Y1 | INT[5] | I/O | HOST, Bidirectional buffer | 515 | AE5 | HADRS[11] | I/O | HOST, Bidirectional buffer |
| 461 | Y2 | INT[4] | I/O | HOST, Bidirectional buffer | 516 | AG4 | HADRS[13] | I/O | HOST, Bidirectional buffer |
| 462 | VDD3 | VDD3 | - | 3.3V I/O power supply | 517 | AH3 | HADRS[30] | I/O | HOST, Bidirectional buffer |
| 463 | Y3 | INT[3] | I/O | HOST, Bidirectional buffer | 518 | VDD3 | VDD3 | - | 3.3V I/O power supply |
| 464 | GND | GND | - | Ground | 519 | AF5 | HADRS[12] | I/O | HOST, Bidirectional buffer |
| 465 | Y4 | INT[2] | I/O | HOST, Bidirectional buffer | 520 | GND | GND | - | Ground |
| 466 | VDD | VDD | - | 1.2V LOGIC power supply | 521 | AH4 | HADRS[14] | I/O | HOST, Bidirectional buffer |
| 467 | W5 | INT[1] | I/O | HOST, Bidirectional buffer | 522 | AE6 | HDATA[1] | I/O | HOST, Bidirectional buffer |
| 468 | AA1 | INT[0] | I/O | HOST, Bidirectional buffer | 523 | AD7 | HADRS[9] | I/O | HOST, Bidirectional buffer |
| 469 | AA2 | SCLK[1] | I/O | HOST, Bidirectional buffer | 524 | VDD3 | VDD3 | - | 3.3V I/O power supply |
| 470 | AA3 | SCLK[0] | I/O | HOST, Bidirectional buffer | 525 | AG5 | HDATA[15] | I/O | HOST, Bidirectional buffer |
| 471 | AB1 | CTS[3] | I/O | HOST, Bidirectional buffer | 526 | GND | GND | - | Ground |
| 472 | GND | GND | - | Ground | 527 | AH5 | HDATA[14] | I/O | HOST, Bidirectional buffer |
| 473 | Y5 | CTS[2] | I/O | HOST, Bidirectional buffer | 528 | GND | GND | - | Ground |
| 474 | GND | GND | - | Ground | 529 | AF6 | HDATA[0] | I/O | HOST, Bidirectional buffer |
| 475 | AA4 | CTS[1] | I/O | HOST, Bidirectional buffer | 530 | AD8 | HDATA[6] | I/O | HOST, Bidirectional buffer |
| 476 | VDD | VDD | - | 1.2V LOGIC power supply | 531 | AE7 | HDATA[2] | I/O | HOST, Bidirectional buffer |
| 477 | AB3 | CTS[0] | I/O | HOST, Bidirectional buffer | 532 | VDD3 | VDD3 | - | 3.3V I/O power supply |
| 478 | AB2 | RTS[3] | I/O | HOST, Bidirectional buffer | 533 | AG6 | HDATA[12] | I/O | HOST, Bidirectional buffer |
| 479 | AC2 | RTS[2] | I/O | HOST, Bidirectional buffer | 534 | VDD | VDD | - | 1.2V LOGIC power supply |
| 480 | AC1 | RTS[1] | I/O | HOST, Bidirectional buffer | 535 | AH6 | HDATA[13] | I/O | HOST, Bidirectional buffer |
| 481 | AA5 | RTS[0] | I/O | HOST, Bidirectional buffer | 536 | AG7 | HDATA[11] | I/O | HOST, Bidirectional buffer |
| 482 | VDD3 | VDD3 | - | 3.3V I/O power supply | 537 | AF7 | HDATA[3] | I/O | HOST, Bidirectional buffer |
| 483 | AB4 | RX[3] | I/O | HOST, Bidirectional buffer | 538 | GND | GND | - | Ground |
| 484 | GND | GND | - | Ground | 539 | AE8 | HDATA[5] | I/O | HOST, Bidirectional buffer |
| 485 | AC3 | RX[2] | I/O | HOST, Bidirectional buffer | 540 | GND | GND | - | Ground |
| 486 | VDD | VDD | - | 1.2V LOGIC power supply | 541 | AD9 | HDATA[7] | I/O | HOST, Bidirectional buffer |
| 487 | AD2 | RX[1] | I/O | HOST, Bidirectional buffer | 542 | AF8 | HDATA[4] | I/O | HOST, Bidirectional buffer |
| 488 | AD1 | RX[0] | I/O | HOST, Bidirectional buffer | 543 | AH7 | HDATA[10] | I/O | HOST, Bidirectional buffer |
| 489 | AB5 | TX[3] | I/O | HOST, Bidirectional buffer | 544 | VDD3 | VDD3 | - | 3.3V I/O power supply |
| 490 | AC4 | TX[2] | I/O | HOST, Bidirectional buffer | 545 | AG8 | HDATA[8] | I/O | HOST, Bidirectional buffer |
| 491 | AD3 | TX[1] | I/O | HOST, Bidirectional buffer | 546 | VDD | VDD | - | 1.2V LOGIC power supply |
| 492 | GND | GND | - | Ground | 547 | AH8 | HDATA[9] | I/O | HOST, Bidirectional buffer |
| 493 | AE1 | TX[0] | I/O | HOST, Bidirectional buffer | 548 | AE9 | HDWE | O | HOST, Output buffer |
| 494 | GND | GND | - | Ground | 549 | AF9 | DQMWS[0] | O | HOST, Output buffer |
| 495 | AE2 | HDACK[1] | O | HOST, Output buffer | 550 | GND | GND | - | Ground |

| No. | BALL Address | Pin Name | I/O | Function | No. | BALL Address | Pin Name | I/O | Function |
|-----|--------------|------------|-----|----------------------------|-----|--------------|-------------|-----|-------------------------------------|
| 551 | AD10 | HDCS[1] | O | HOST, Output buffer | 606 | AG16 | TMS | I | TEST, Input buffer |
| 552 | GND | GND | – | Ground | 607 | GND | GND | – | Ground |
| 553 | AG9 | DQMWS[1] | O | HOST, Output buffer | 608 | AF16 | TDO | O | TEST, Output buffer |
| 554 | VDD3 | VDD3 | – | 3.3V I/O power supply | 609 | VDD | VDD | – | 1.2V LOGIC power supply |
| 555 | AH9 | HCLKO | O | HOST, Output buffer | 610 | AE16 | TDI | I | TEST, Input buffer |
| 556 | GND | GND | – | Ground | 611 | VDD3 | VDD3 | – | 3.3V I/O power supply |
| 557 | AE10 | HDCS[0] | O | HOST, Output buffer | 612 | AH17 | TRST | I | TEST, Input buffer |
| 558 | VDD3 | VDD3 | – | 3.3V I/O power supply | 613 | GND | GND | – | Ground |
| 559 | AD11 | HADRS[15] | I/O | HOST, Bidirectional buffer | 614 | AD16 | TCK | I | TEST, Input buffer |
| 560 | VDD | VDD | – | 1.2V LOGIC power supply | 615 | VDD3 | VDD3 | – | 3.3V I/O power supply |
| 561 | AF10 | HCAS | O | HOST, Output buffer | 616 | AG17 | PLL RST | I | CLOCK, Input buffer |
| 562 | AG10 | HRAS | O | HOST, Output buffer | 617 | GND | GND | – | Ground |
| 563 | AH10 | HCLKEN | O | HOST, Output buffer | 618 | AF17 | DV VCLKO | O | CLOCK, Output buffer |
| 564 | GND | GND | – | Ground | 619 | VDD3 | VDD3 | – | 3.3V I/O power supply |
| 565 | AE11 | HADRS[16] | I/O | HOST, Bidirectional buffer | 620 | AE17 | PXCLK | O | CLOCK, Output buffer |
| 566 | GND | GND | – | Ground | 621 | GND | GND | – | Ground |
| 567 | AF11 | HADRS[17] | I/O | HOST, Bidirectional buffer | 622 | AH18 | REC656[7] | I | VIDEO-Digital, Input buffer |
| 568 | AD12 | HADRS[27] | I/O | HOST, Bidirectional buffer | 623 | VDD | VDD | – | 1.2V LOGIC power supply |
| 569 | AG11 | HADRS[20] | I/O | HOST, Bidirectional buffer | 624 | AG18 | REC656[6] | I | VIDEO-Digital, Input buffer |
| 570 | VDD3 | VDD3 | – | 3.3V I/O power supply | 625 | GND | GND | – | Ground |
| 571 | AH11 | HADRS[21] | I/O | HOST, Bidirectional buffer | 626 | AD17 | REC656[5] | I | VIDEO-Digital, Input buffer |
| 572 | VDD | VDD | – | 1.2V LOGIC power supply | 627 | AF18 | REC656[4] | I | VIDEO-Digital, Input buffer |
| 573 | AE12 | HADRS[19] | I/O | HOST, Bidirectional buffer | 628 | AE18 | REC656[3] | I | VIDEO-Digital, Input buffer |
| 574 | AF12 | HADRS[18] | I/O | HOST, Bidirectional buffer | 629 | AH19 | REC656[2] | I | VIDEO-Digital, Input buffer |
| 575 | AG12 | HADRS[23] | I/O | HOST, Bidirectional buffer | 630 | AG19 | REC656[1] | I | VIDEO-Digital, Input buffer |
| 576 | GND | GND | – | Ground | 631 | AF19 | REC656[0] | I | VIDEO-Digital, Input buffer |
| 577 | AD13 | HADRS[28] | I/O | HOST, Bidirectional buffer | 632 | AH20 | DV VIDEO[7] | I/O | VIDEO-Digital, Bidirectional buffer |
| 578 | VDD | VDD | – | 1.2V LOGIC power supply | 633 | AD18 | DV VIDEO[6] | I/O | VIDEO-Digital, Bidirectional buffer |
| 579 | AH12 | HADRS[22] | I/O | HOST, Bidirectional buffer | 634 | AE19 | DV VIDEO[5] | I/O | VIDEO-Digital, Bidirectional buffer |
| 580 | GND | GND | – | Ground | 635 | VDD3 | VDD3 | – | 3.3V I/O power supply |
| 581 | AE13 | HADRS[29] | I/O | HOST, Bidirectional buffer | 636 | AG20 | DV VCLKI | I | CLOCK, Input buffer |
| 582 | VDD | VDD | – | 1.2V LOGIC power supply | 637 | AF20 | PLL2AVDD | – | |
| 583 | AF13 | HADRS[24] | I/O | HOST, Bidirectional buffer | 638 | AH21 | PLL2AVSS | – | |
| 584 | VDD3 | VDD3 | – | 3.3V I/O power supply | 639 | AD19 | R656CLKI | I | CLOCK, Input buffer |
| 585 | AG13 | HADRS[25] | I/O | HOST, Bidirectional buffer | 640 | GND | GND | – | Ground |
| 586 | GND | GND | – | Ground | 641 | AE20 | ADMCLKI | I | CLOCK, Input buffer |
| 587 | AH13 | HADRS[26] | I/O | HOST, Bidirectional buffer | 642 | VDD3 | VDD3 | – | 3.3V I/O power supply |
| 588 | GND | GND | – | Ground | 643 | AG21 | DV VIDEO[4] | I/O | VIDEO-Digital, Bidirectional buffer |
| 589 | GND | GND | – | Ground | 644 | AF21 | DV VIDEO[3] | I/O | VIDEO-Digital, Bidirectional buffer |
| 590 | AD14 | TESTMOD[6] | I | TEST, Input buffer | 645 | AD20 | DV VIDEO[2] | I/O | VIDEO-Digital, Bidirectional buffer |
| 591 | AE14 | VDD | – | 1.2V LOGIC power supply | 646 | AH22 | DV VIDEO[1] | I/O | VIDEO-Digital, Bidirectional buffer |
| 592 | AF14 | TESTMOD[5] | I | TEST, Input buffer | 647 | AG22 | DV VIDEO[0] | I/O | VIDEO-Digital, Bidirectional buffer |
| 593 | GND | GND | – | Ground | 648 | AE21 | REC656O[7] | O | VIDEO-Digital, Output buffer |
| 594 | AG14 | TESTMOD[4] | I | TEST, Input buffer | 649 | AF22 | REC656O[6] | O | VIDEO-Digital, Output buffer |
| 595 | VDD | VDD | – | 1.2V LOGIC power supply | 650 | VDD | VDD | – | 1.2V LOGIC power supply |
| 596 | AH14 | TESTMOD[3] | I | TEST, Input buffer | 651 | AH23 | DV REQ | I | VIDEO-Digital, Input buffer |
| 597 | GND | GND | – | Ground | 652 | GND | GND | – | Ground |
| 598 | AH15 | TESTMOD[2] | I | TEST, Input buffer | 653 | AG23 | DV ACK | O | VIDEO-Digital, Output buffer |
| 599 | VDD | VDD | – | 1.2V LOGIC power supply | 654 | GND | GND | – | Ground |
| 600 | AG15 | TESTMOD[1] | I | TEST, Input buffer | 655 | AE22 | AVSS1DA10 | – | |
| 601 | GND | GND | – | Ground | 656 | AD21 | GOUT | O | VIDEO-Analog |
| 602 | AF15 | TESTMOD[0] | I | TEST, Input buffer | 657 | AH24 | AVDD1DA10 | – | |
| 603 | AE15 | CSYNC | I | CLOCK, Input buffer | 658 | AF23 | BOUT | O | VIDEO-Analog |
| 604 | AD15 | VIPWM | O | CLOCK, Output buffer | 659 | AE23 | AVDD1DA10 | – | |
| 605 | AH16 | PLLON | I | TEST, Input buffer | 660 | AG24 | ROUT | O | VIDEO-Analog |

| No. | BALL Address | Pin Name | I/O | Function | No. | BALL Address | Pin Name | I/O | Function |
|-----|--------------|------------|-----|------------------------------|-----|--------------|------------|-----|------------------------------|
| 661 | AD22 | IREF[0] | – | VIDEO-Analog | 669 | AD23 | REC656O[4] | O | VIDEO-Digital, Output buffer |
| 662 | AF24 | IREF[1] | – | VIDEO-Analog | 670 | AH27 | REC656O[3] | O | VIDEO-Digital, Output buffer |
| 663 | AG25 | YOUT | O | VIDEO-Analog | 671 | AG26 | REC656O[2] | O | VIDEO-Digital, Output buffer |
| 664 | AH25 | AVSS2DA10 | – | | 672 | AG27 | REC656O[1] | O | VIDEO-Digital, Output buffer |
| 665 | AE24 | COUT | O | VIDEO-Analog | 673 | GND | GND | – | Ground |
| 666 | AH26 | AVDD2DA10 | – | | 674 | AD24 | REC656O[0] | O | VIDEO-Digital, Output buffer |
| 667 | GND | GND | – | Ground | 675 | AE25 | AGCCTL | O | VIDEO-Analog |
| 668 | AF25 | REC656O[5] | O | VIDEO-Digital, Output buffer | | | | | |

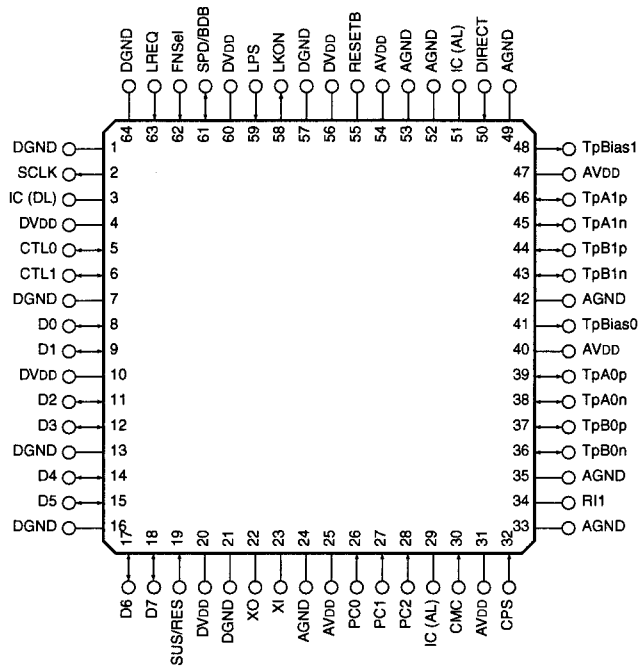
● Others

| BALL Address | Pin Name | BALL Address | Pin Name | BALL Address | Pin Name | BALL Address | Pin Name |
|--------------|----------|--------------|----------|--------------|----------|--------------|----------|
| AA23 | GND | P12 | GND | AC11 | VDD | AB23 | VDD3 |
| AA6 | GND | P13 | GND | AC14 | VDD | AB6 | VDD3 |
| AC12 | GND | P14 | GND | AC6 | VDD | AC10 | VDD3 |
| AC17 | GND | P15 | GND | AC8 | VDD | AC13 | VDD3 |
| AC20 | GND | P16 | GND | L6 | VDD | AC16 | VDD3 |
| AC9 | GND | P17 | GND | AC11 | VDD | AC19 | VDD3 |
| F11 | GND | R12 | GND | AC14 | VDD | AC22 | VDD3 |
| F14 | GND | R13 | GND | AC6 | VDD | AC7 | VDD3 |
| F17 | GND | R14 | GND | AC8 | VDD | F10 | VDD3 |
| F20 | GND | R15 | GND | L6 | VDD | F13 | VDD3 |
| F23 | GND | R16 | GND | P6 | VDD | F16 | VDD3 |
| F8 | GND | R17 | GND | U6 | VDD | F19 | VDD3 |
| H6 | GND | R23 | GND | Y6 | VDD | F22 | VDD3 |
| J23 | GND | R6 | GND | F12 | VDD | F7 | VDD3 |
| M12 | GND | T12 | GND | F6 | VDD | G23 | VDD3 |
| M13 | GND | T13 | GND | F9 | VDD | G6 | VDD3 |
| M14 | GND | T14 | GND | J6 | VDD | K23 | VDD3 |
| M15 | GND | T15 | GND | AC15 | VDD | K6 | VDD3 |
| M16 | GND | T16 | GND | AC18 | VDD | N23 | VDD3 |
| M17 | GND | T17 | GND | AC21 | VDD | N6 | VDD3 |
| M23 | GND | U12 | GND | AC23 | VDD | T23 | VDD3 |
| M6 | GND | U13 | GND | F15 | VDD | T6 | VDD3 |
| N12 | GND | U14 | GND | F18 | VDD | W23 | VDD3 |
| N13 | GND | U15 | GND | F21 | VDD | W6 | VDD3 |
| N14 | GND | U16 | GND | H23 | VDD | | |
| N15 | GND | U17 | GND | L23 | VDD | | |
| N16 | GND | V23 | GND | P23 | VDD | | |
| N17 | GND | V6 | GND | U23 | VDD | | |
| | | | | Y23 | VDD | | |

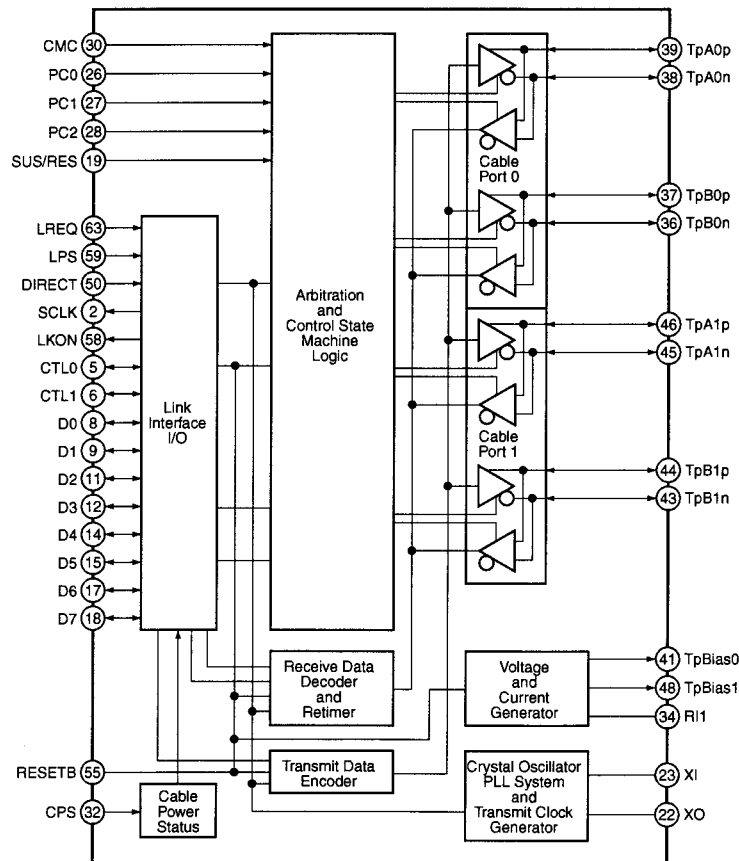
■ UPD72852AGB-8EU (MAIN ASSY : IC5101)

• IEEE1394 Physical IC

● Pin Arrangement



● Block Diagram



● Pin Function

• Cable Interface Pins

| No. | Pin Name | I/O | Function |
|-----|----------|-----|--|
| 39 | TpA0p | I/O | Port 0 twisted pair cable A positive phase I/O |
| 38 | TpA0n | I/O | Port 0 twisted pair cable A negative phase I/O |
| 37 | TpB0p | I/O | Port 0 twisted pair cable B positive phase I/O |
| 36 | TpB0n | I/O | Port 0 twisted pair cable B negative phase I/O |
| 46 | TpA1p | I/O | Port 1 twisted pair cable A positive phase I/O |
| 45 | TpA1n | I/O | Port 1 twisted pair cable A negative phase I/O |
| 44 | TpB1p | I/O | Port 1 twisted pair cable B positive phase I/O |
| 43 | TpB1n | I/O | Port 1 twisted pair cable B negative phase I/O |
| 19 | SUS/RES | I | Suspend/Resume function select 1 : Suspend/Resume on (IEEE1394a-2000 compliant) 0 : Suspend/Resume off (P1394a draft 1.3 compliant) |
| 32 | CPS | I | Cable power status Connect to the cable through a 390 kΩ resistor and to the GND through a 100 kΩ resistor. 0 : Cable power fail 1 : Cable power on |

• Link Interface Pins

| No. | Pin Name | I/O | Function |
|-----|----------|-----|---|
| 8 | D0 | I/O | Data input/output (bit 0) |
| 9 | D1 | I/O | Data input/output (bit 1) |
| 11 | D2 | I/O | Data input/output (bit 2) |
| 12 | D3 | I/O | Data input/output (bit 3) |
| 14 | D4 | I/O | Data input/output (bit 4) |
| 15 | D5 | I/O | Data input/output (bit 5) |
| 17 | D6 | I/O | Data input/output (bit 6) |
| 18 | D7 | I/O | Data input/output (bit 7) |
| 5 | CTL0 | I/O | Link interface control (bit 0) |
| 6 | CTL1 | I/O | Link interface control (bit 1) |
| 63 | LREQ | I | Link request input |
| 2 | SCLK | O | Link control output clock LPS 1 : 49.152 MHz output LPS 0 : Clamp to 0 (The clock signal will be output within 25 μsec after change to "0") |
| 59 | LPS | I | Link power status input 0 : Link power off 1 : Link power on (PHY/Link direct connection) |
| 58 | LKON | O | Link-on signal output Link-on signal is 6.1444 MHz clock output. |
| 50 | DIRECT | I | PHY/Link isolation barrier control input 0 : Isolation barrier 1 : PHY/Link direct connection |

• Control Pins

| No. | Pin Name | I/O | Function |
|-----|----------|----------------|--|
| 26 | PC0 | I | Power class set input This pin status will be loaded to Pwr_class bit which allocated to PHY register 4H. IEEE1394a-2000 chapter [4.3.4.1] |
| 27 | PC1 | I | |
| 28 | PC2 | I | |
| 30 | CMC | I | Configuration manager capable setting This pin status will be loaded to Contender bit which allocated to PHY register 4H. 0 : Non contender 1 : Contender |
| 55 | RESETB | I | Power on reset input Connect to GND through a 0.1 μ F capacitor. 0 : Reset 1 : Normal |
| 61 | SPD/BDB | I FNSel = 0 | Speed select (UPD72852GB) 0 : MAX. S200 1 : MAX. S400 |
| | | O FNSel = 1 | BIAS Detected output (Logical Inverse) 0 : BIAS is coming from some port. 1 : BIAS is not coming from any port. |

• IC

| No. | Pin Name | I/O | Function |
|--------|----------|-----|---|
| 29, 51 | IC (AL) | – | Internally Connected (Low Clamped) Connected to GND. |
| 3 | IC (DL) | – | Internally Connected (Low Clamped) Connected to GND. |

• Power Supply Pins

| No. | Pin Name | I/O | Function |
|----------------------------|----------|-----|--------------|
| 25, 31, 40, 47, 54 | AVDD | – | Analog power |
| 24, 33, 35, 42, 49, 52, 53 | AGND | – | Analog GND |
| 4, 10, 20, 56, 60 | DVDD | – | Digital VDD |
| 1, 7, 13, 16, 21, 57, 64 | DGND | – | Digital GND |

• Other Pins

| No. | Pin Name | I/O | Function |
|-----|----------|-----|---|
| 41 | TpBias0 | O | Port 0 twisted pair output |
| 48 | TpBias1 | O | Port 1 twisted pair output |
| 34 | RI1 | – | Resistor connection pin 1 for reference current generator Please connect to GND pin through the 9.1 k Ω resistor. |
| 23 | XI | – | Crystal oscillator connection XI |
| 22 | XO | – | Crystal oscillator connection XO |
| 62 | FNSel | I | Function Select 0 : #61 acts as SPD (UPD72852GB compliant) 1 : #61 acts as BDB |

UPD72893AGD-LML (MAIN ASSY : IC5202)

• IEEE1394 Link IC

A

• Pin Arrangement

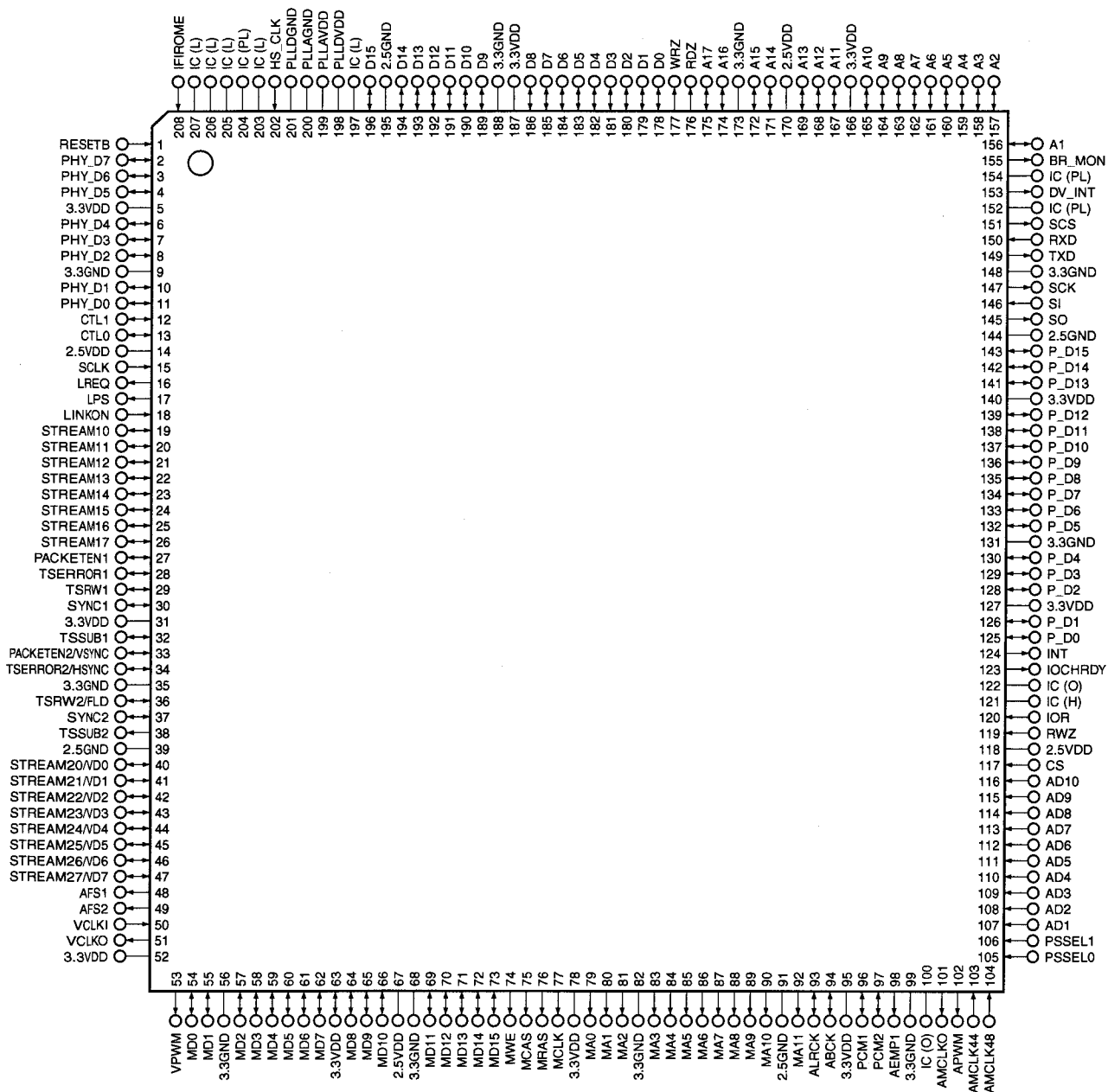
B

C

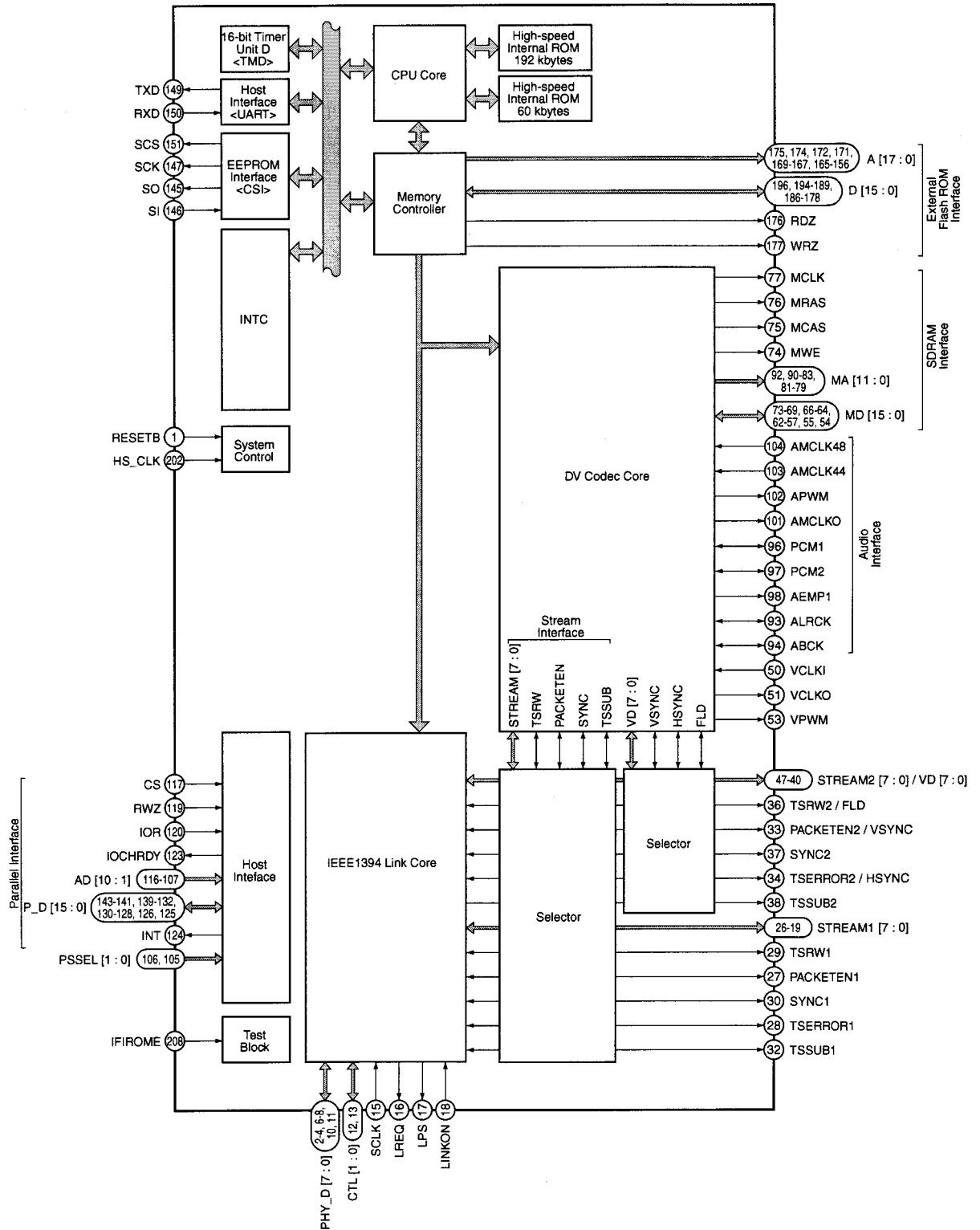
D

E

F



● Block Diagram



● Pin Function

(1) Link relation

| No. | Pin Name | I/O | Function | Active |
|------------------|-----------------|-----|---|--------|
| 18 | LINKON | I | Link-on signal input Clock input When LPS is active, input 0. | — |
| 17 | LPS | O | Link power status output Link power OFF : 0 Link power ON : 2.7 MHz pulse output (20 dividing of host clock 54 MHz) | — |
| 16 | LREQ | O | Link request output | — |
| 15 | SCLK | I | Clock input for Link control LPS is active : 49.152 MHz input LPS = 0 0 : fixed | — |
| 12, 13 | CTL [1 : 0] | I/O | PHY/Link control signal input/output | — |
| 2-4, 6-8, 10, 11 | PHY_D [7 : 0] | I/O | Data input/output between PHY-Link | — |
| 26-19 | STREAM1 [7 : 0] | I/O | ISO data bus of stream interface 1 | — |
| 27 | PACKETEN1 | I/O | Packet enable signal input/output of stream interface 1 | H/L |
| 28 | TSERROR1 | I/O | Packet error signal input/output of stream interface 1 | H/L |
| 29 | TSRW1 | I/O | Data read/write enable signal input/output of stream interface 1 | — |
| 30 | SYNC1 | I/O | Frame synchronous signal input/output of stream interface 1 | H/L |
| 32 | TSSUB1 | I/O | Not used Connect to VDD or GND through a resistor. | H/L |
| 47-40 | STREAM2 [7 : 0] | I/O | ISO data bus of stream interface 2 | — |
| 33 | PACKETEN2 | I/O | Packet enable signal input/output of stream interface 2 | H/L |
| 34 | TSERROR2 | I/O | Packet error signal input/output of stream interface 2 | H/L |
| 36 | TSRW2 | I/O | Data read/write enable signal input/output of stream interface 2 | — |
| 37 | SYNC2 | I/O | Frame synchronous signal input/output of stream interface 2 | H/L |
| 38 | TSSUB2 | O | Not used Set to open. | — |

(2) Video interface pins

| No. | Pin Name | I/O | Function | Active |
|-------|------------|-----|-------------------------------|--------|
| 50 | VCLKI | I | Video clock input (27 MHz) | — |
| 51 | VCLKO | O | Video clock output (27 MHz) | — |
| 47-40 | VD [7 : 0] | I/O | Video data signal | — |
| 33 | VSYNC | I/O | Video vertical sync. signal | L |
| 34 | HSYNC | I/O | Video horizontal sync. signal | L |
| 36 | FLD | I/O | Field index signal | — |
| 53 | VPWM | O | PWM signal for video PLL | — |

(3) Audio interface pins

| No. | Pin Name | I/O | Function | Active |
|--------|-------------|-----|---|--------|
| 104 | AMCLK48 | I | Audio master clock input for sampling frequency 48 kHz | – |
| 103 | AMCLK44 | I | Audio master clock input for sampling frequency 44 kHz | – |
| 101 | AMCLKO | O | Audio master clock output | – |
| 96 | PCM1 | I/O | Audio PCM serial data At 2ch : System 1 (data of audio block 1) At 4ch : System 1 The above is default setting value. Input/output data of PCM 1 and PCM 2 is replaced by Channel swap setting of an AUDIO_FUNC register. | – |
| 97 | PCM2 | I/O | Audio PCM serial data At 2ch : Mute At 4ch : System 2 (data of audio block 2) The above is default setting value. Input/output data of PCM 1 and PCM 2 is replaced by Channel swap setting of an AUDIO_FUNC register. Note: Cannot use it in DV decode. | – |
| 98 | AEMP1 | O | PCM1 emphasis ON/OFF in PCM 1 output | H |
| 93 | ALRCK | I/O | Audio LR clock L ch : High R ch : Low | – |
| 94 | ABCK | I/O | Audio bit clock | – |
| 49, 48 | AFS [2 : 1] | O | Audio sampling frequency AFS2 AFS1 44.1 kHz 0 1 48 kHz 0 0 32 kHz 1 0 | – |
| 102 | APWM | O | PWM signal for audio PLL | – |

(4) SDRAM interface pins

| No. | Pin Name | I/O | Function | Active |
|--------------------------------|--------------|-----|---|--------|
| 77 | MCLK | O | CLK pin connection of SDRAM | – |
| 76 | MRAS | O | RAS pin connection of SDRAM | – |
| 75 | MCAS | O | CAS pin connection of SDRAM | – |
| 74 | MWE | O | WE pin connection of SDRAM | – |
| 92, 90-83, 81-79 | MA [11 : 0] | O | Address pin connection of SDRAM | – |
| 73-69, 66-64, 62-57, 55, 54 | MD [15 : 0] | I/O | Data pin connection of SDRAM Note: Process of pull-up or pull down is necessary. So connect it to SDRAM directly. | – |

(5) Host interface pins

(a) Parallel interface pins

| No. | Pin Name | I/O | Function | Active |
|--|--------------|-----|---|--------|
| 117 | CS | I | Chip select input of parallel interface | L |
| 119 | RWZ | I | Read and write control input of parallel interface ISA type bus, SH-1 bus: Write strobe 68000 bus : Read/write selection signal | L |
| 120 | IOR | I | IO read control input of parallel interface ISA type bus, SH-1 bus : Read strobe 68000 bus : Data strobe (DS) | L |
| 123 | IOCHRDY | O | Ready output of parallel interface | L |
| 116-107 | AD [10 : 1] | I | Address input of parallel interface | — |
| 143-141, 139-132, 130-128, 126, 125 | P_D [15 : 0] | I/O | Data input/output of parallel interface | — |

(b) Serial interface pins

| No. | Pin Name | I/O | Function | Active |
|-----|----------|-----|--|--------|
| 149 | TXD | I/O | Serial transmission data output of unsynchronous serial interface (UART) | — |
| 150 | RXD | I/O | Serial transmission data input of unsynchronous serial interface (UART) | — |

(c) Others

| No. | Pin Name | I/O | Function | Active |
|----------|---------------|-----|---|--------|
| 124 | INT | O | Interrupt output to the outside | H |
| 106, 105 | PSSEL [1 : 0] | I | Parallel/serial interface selection Input signal to select the outside interface which of parallel interface or serial interface. PSSEL [1 : 0] Select 00 Serial interface (UART) 01 Parallel interface (ISA type bus) 10 Parallel interface (68000 bus) 11 Parallel interface (SH-1 bus) | — |

(6) External ROM connection pins

(a) Flash ROM interface pins

| No. | Pin Name | I/O | Function | Active |
|--|------------|-----|--|--------|
| 196, 194-189, 186-178 | D [15 : 0] | I/O | External ROM data bus Data bus in the external ROM access. Process of pull-up or pull down is necessary. | - |
| 175, 174, 172, 171, 169-167, 165-156 | A [17 : 1] | O | External ROM address bus Address bus in the external ROM access. Can addressing the 256k byte space. | - |
| 176 | RDZ | O | ROM read Strobe signal which shows a read cycle for external ROM. It becomes the inactive in the idle state. | L |
| 177 | WRZ | O | ROM write Strobe signal which shows a write cycle for external ROM. | L |

(b) EEPROM interface pins

| No. | Pin Name | I/O | Function | Active |
|-----|----------|-----|--|--------|
| 145 | SO | I/O | Serial transmit data output of clock-synchronous system serial interface (CSI) | - |
| 146 | SI | I/O | Serial receive data input of clock-synchronous system serial interface (CSI) | - |
| 147 | SCK | I/O | Clock output of clock-synchronous system serial interface (CSI) | - |
| 151 | SCS | I/O | Chip select output of clock-synchronous system serial interface (CSI) | - |

(7) Clock and reset pins

| No. | Pin Name | I/O | Function | Active |
|-----|----------|-----|--|--------|
| 1 | RESETB | I | Reset RESETB input is asynchronous input. When a signal of fixed low-level width is input without relation to an operation clock, take precedence of all operation, and reset the system. Note: RESETB is low-active. | L |
| 202 | HS_CLK | I | Host clock Clock input pin which is supplied to CPU core and built-in peripheral I/O. Please input 27 MHz clock. Perform 2 multiply with internal PLL by 27 MHz clock, 54 MHz clock is supplied to CPU core and internal peripheral I/O. | - |

(8) Power supply and ground pins

| No. | Pin Name | I/O | Function | Active |
|---|----------|-----|--|--------|
| 5, 31, 52, 63, 78, 95, 127, 140, 166, 187 | 3.3VDD | – | 3.3V power supply 3.3V positive power supply pins. Power supply for 3.3V interface I/O. | – |
| 14, 67, 118, 170 | 2.5VDD | – | 2.5V power supply 2.5V positive power supply pins. Power supply for internal each block. | – |
| 39, 91, 144, 195 | 2.5GND | – | Ground pins Connect all GND pins to the common ground. | – |
| 9, 35, 56, 68, 82, 99, 131, 148, 173, 188 | 3.3GND | | | – |
| 199 | PLLAVDD | – | Analog power supply for multiply circuit Analog positive power supply pin for PLL. Supply 2.5V. | – |
| 200 | PLLAGND | – | Analog ground for multiply circuit Analog ground for PLL | – |
| 198 | PLLDVDD | – | Digital power supply for multiply circuit Digital positive power supply pin for PLL. Supply 2.5V. | – |
| 201 | PLLDGND | – | Digital ground for multiply circuit Digital ground for PLL | – |
| 121 | IC (H) | – | Internally connected pin Connect to VDD directly. | – |
| 197, 203, 205-207 | IC (L) | – | Internally connected pin Connect to ground directly. | – |
| 152, 154, 204 | IC (PL) | – | Internally connected pin Connect to ground through a resistor. | – |
| 100, 122 | IC (O) | – | Internally connected pin Set to open. | – |

(9) Others

| No. | Pin Name | I/O | Function | Active |
|-----|----------|-----|--|--------|
| 153 | DV_INT | I/O | Interrupt pin to the outside for the DV status read out. | H |
| 155 | BR_MON | I/O | Shows the bus reset occurred. There is some delay after real bus reset occurred because of set by the built-in firmware. | H |
| 208 | IFIROME | I | ROM operation selection input Set to 1 normally. | – |

- VIF/SIF IC

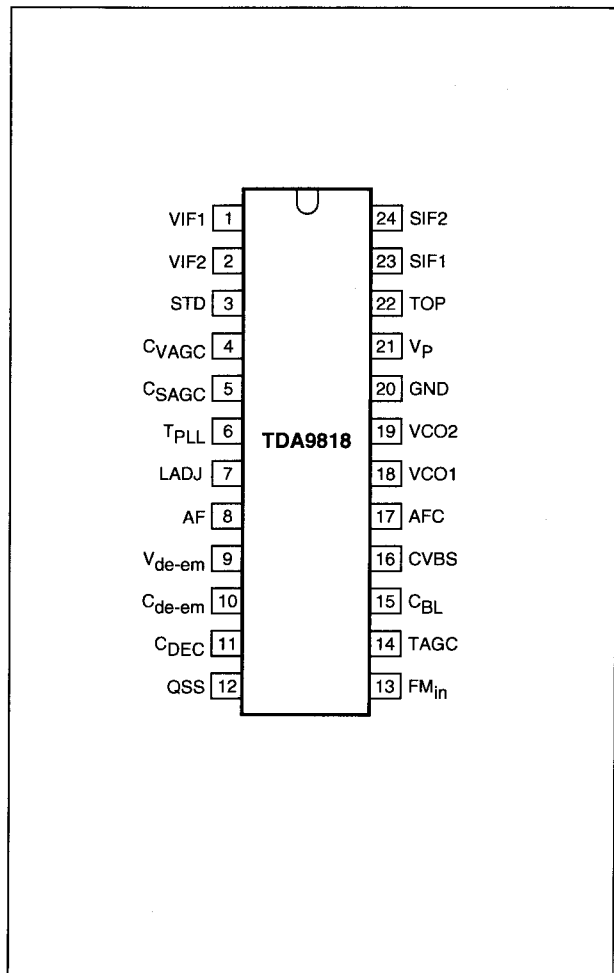


A

● PIN FUNCTION

| SYMBOL | PIN | DESCRIPTION |
|--------------------|-----|--|
| VIF1 | 1 | VIF differential input signal voltage 1 |
| VIF2 | 2 | VIF differential input signal voltage 2 |
| STD | 3 | standards selection switch; note 1 |
| C _{VAGC} | 4 | VIF AGC capacitor |
| C _{SAGC} | 5 | SIF AGC capacitor |
| T _{PLL} | 6 | PLL filter |
| LADJ | 7 | L/L accent switch and adjust |
| AF | 8 | audio output |
| V _{de-em} | 9 | de-emphasis output |
| C _{de-em} | 10 | de-emphasis input |
| C _{DEC} | 11 | decoupling capacitor |
| QSS | 12 | single reference QSS/intercarrier output voltage |
| FM _{in} | 13 | sound intercarrier input voltage |
| TAGC | 14 | tuner AGC output |
| C _{BL} | 15 | black level detector |
| CVBS | 16 | composite video output voltage |
| AFC | 17 | AFC output |
| VCO1 | 18 | VCO1 resonance circuit |
| VCO2 | 19 | VCO2 resonance circuit |
| GND | 20 | ground |
| V _P | 21 | supply voltage |
| TOP | 22 | tuner AGC takeover point adjust |
| SIF1 | 23 | SIF differential input signal voltage 1 |
| SIF2 | 24 | SIF differential input signal voltage 2 |

● PIN LAYOUT



B

C

D

E

F

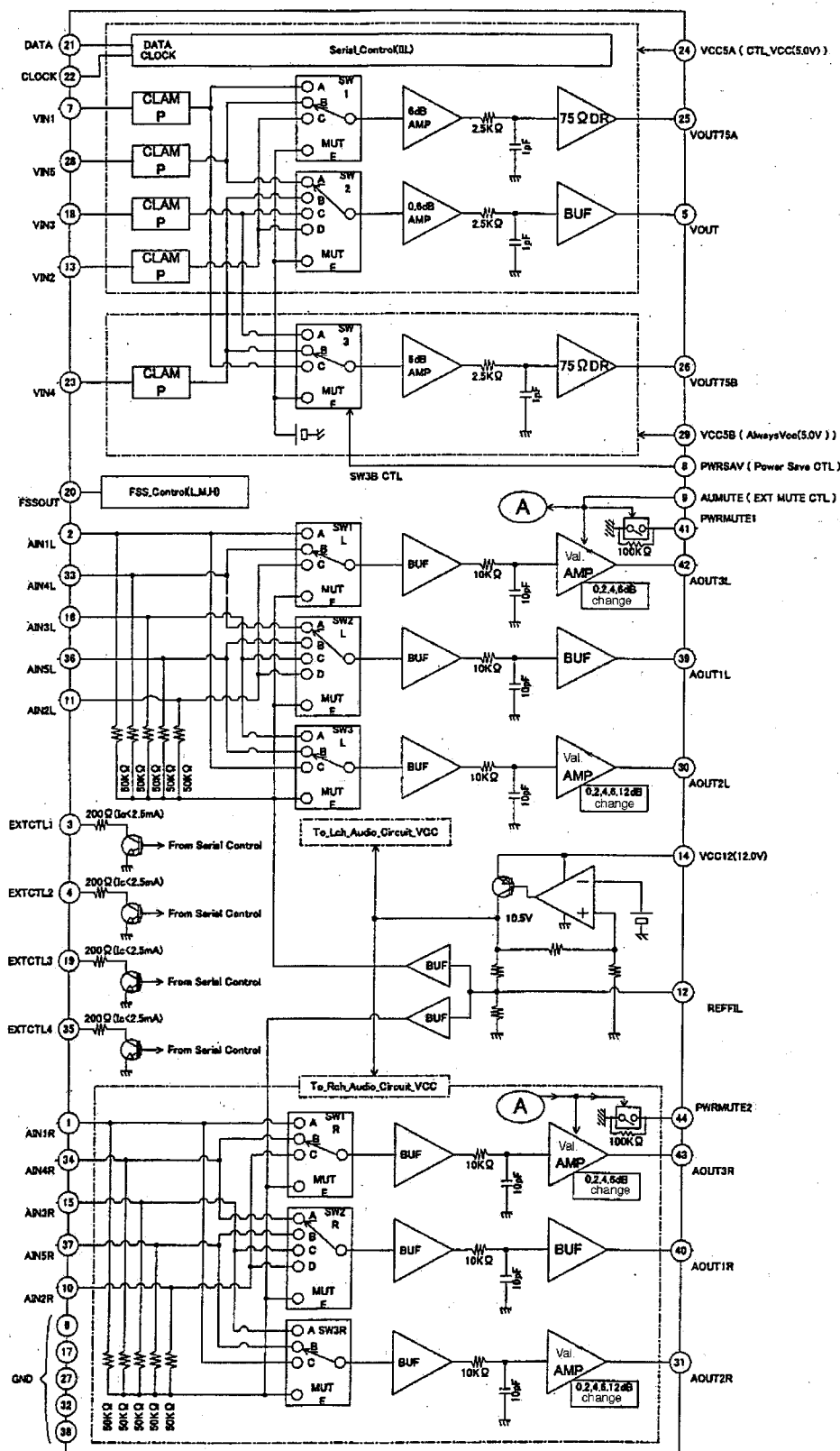
LA73026AV (SCRB ASSY : IC101)

• Dual SCART Interface IC

● Pin Function

| No. | Pin Name | DC Voltage | Function |
|--|--|---|--|
| 1 2 10 11 15 16 33 34 36 37 | AIN1R AIN1L AIN2R AIN2L AIN3R AIN3L AIN4L AIN4R AIN5L AIN5R | 5.58V | Audio input terminal |
| 3 4 19 35 | EXTCTL1 EXTCTL2 EXTCTL3 EXTCTL4 | 2.5mA, ON →0.75V OFF →OPEN | General purpose output Opencollector |
| 5 | VOUT | 1.10V | Video output terminal Push-pull output/Low-impedance |
| 6 17 27 32 38 | GND GND EXT-75ΩDR-GND DEC-75Ω-GND GND | 0V | |
| 7 13 18 23 28 | VIN1 VIN2 VIN3 VIN4 VIN5 | 1.8V | Video input terminal Sync-tip clamp Input/Hi-impedance |
| 8 | PWRS AV | 0.2V | Power save mode select pin OPEN : L |
| 9 | AUMUTE | 0.05V | Control terminal for audio mute OPEN : L |
| 12 | REFFIL | 4.94V | Terminal for Ref_DC ripple removing |
| 14 | VCC12 | | Vcc for audio |
| 20 | FSSOUT | H : Vcc-0.5V M : 6V L : 0V | FSS control terminal Output H, M, L 3 values with serial control |
| 21 | DATA | | Confirmed to IIC BUS. Data input terminal |
| 22 | CLOCK | | Confirmed to IIC BUS. Clock input terminal |
| 24 | VCC5A | | Control Vcc for Video |
| 25 26 | VOUT75A VOUT75B | 1.10V | Video driver output terminal Push-pull output/Low-impedance |
| 29 | VCC5B | | Always VCC for Video |
| 30 31 42 43 | AOUT2L AOUT2R AOUT3L AOUT3R | 4.91V | Audio output terminal Push-pull output/Low-impedance |
| 39 40 | AOUT1L AOUT1R | 4.91V | Audio output terminal Push-pull output/Low-impedance |
| 41 44 | PWRMUTE1 PWRMUTE2 | 0V | Output terminal of audio muting |

● Block Diagram



7.3 OUTLINE OF THE PRODUCT

■ Main newly developed technologies

1. Pickup

The pickup supports quadruple-speed recording for the DVD-R/RW.

A liquid-crystal tilt servo system is adopted for the pickup.

2. Recording-signal-processing LSI

- UPD3320GC (DRIVE Assy: IC101)

The recording-signal-processing module of conventional models consists of two chips, but this has been integrated into a single newly developed recording-signal-processing LSI, enabling stable performance and cost reduction.

3. AV-signal-processing LSI

- M65672WG-B (MAIN Assy: IC1001)

The AV-signal-processing module of conventional models consists of eleven chips, but this has been integrated into a single newly developed AV-signal-processing LSI, enabling large-scale cost reduction while maintaining the conventional functions. In the new LSI, all the basic functions necessary for a DVD recorder have been integrated. Like conventional models, this model is designed to support multitasking. The main functions are as follows:

- 3-D Y/C separation
- Video decoding
- Frame TBC
- MPEG video encoding
- Dolby Digital Consumer Encoding
- ATA/ATAPI I/F (2 ch)
- Main CPU (32-bit RISC, 54 MHz)
- Graphics engine (OSD, scaling, mixing)
- MPEG video decoding
- Audio decoding (AC-3, MPEG)
- Video encoding
- Progressive conversion
- Audio I/F
- 3-D DNR for playback

4. DV-signal-processing LSI

The DV-signal-processing LSI consists of the following two chips:

- UPD72862AGB-SEU (MAIN Assy: IC5101)

A 400-Mbps two-port PHY LSI in compliance with the IEEE1394a-2000 standards

- UPD72893AGD-LML (MAIN Assy: IC5202)

An IEEE1394 link controller LSI having DV (digital video) encoding/decoding functions. Encoding/decoding of digital video signals in compliance with the SD specifications (NTSC/PAL) of the DV standard is supported. The 32-bit RISC CPU is built in for controlling the IEEE1394 bus and sending/receiving AV/C commands.

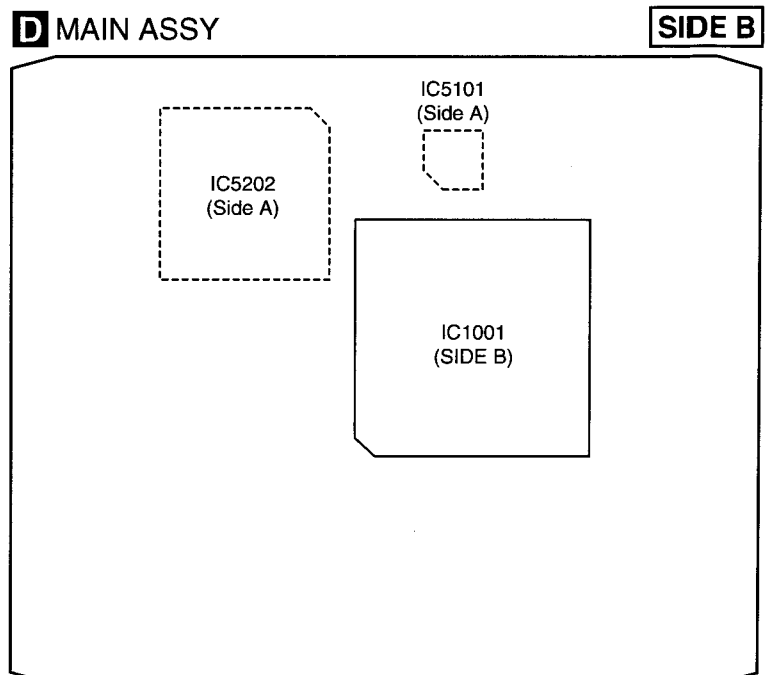


Fig.1 MAIN Assy

System configuration

In each signal-processing LSI of the main function blocks, various processes have been integrated into one chip, which enables simpler system configuration. With the AV-signal-processing LSI at the center, video inputs/outputs, audio inputs/outputs, DV inputs/outputs, writer, HDD, and various memory cells are connected to it.

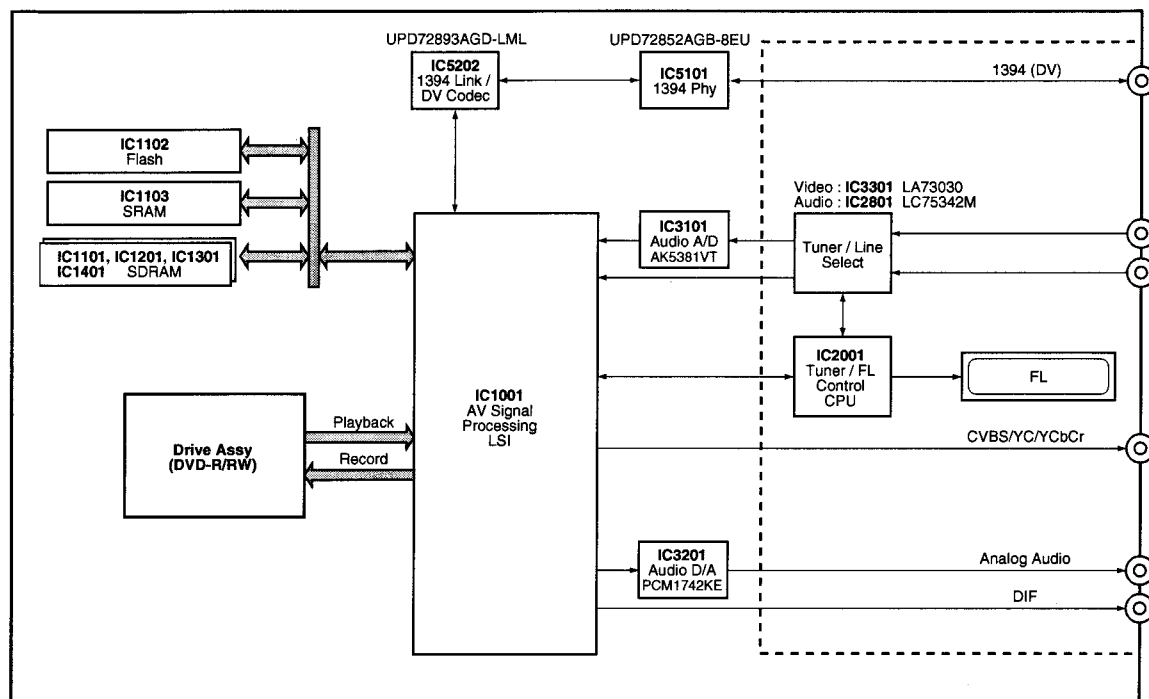


Fig2. System configuration

■ New functions and specifications

In this model, the following new functions and specifications have been included in addition to those of conventional models:

1. Improved multitasking functions

This model supports DVD multitasking (only in VR mode), which was impossible with conventional models.

① Pursuit playback

Playback of the title being recorded by the DVD drive in VR mode.

② Simultaneous recording/playback

Playback of a title other than that being recorded by the DVD drive in VR mode.

2. Advanced disc NAVI

In the conventional disc NAVI function, recorded titles are displayed with still pictures as a list. In the advanced disc NAVI function, the title selected with the cursor is displayed as an animated picture with sound.

3. Improved Still Picture menu in Video mode

The disc NAVI function, which enables displaying a list of recorded titles with still pictures, is enabled in Video mode with this model. Selection from among nine title menus is also supported.

4. Adoption of MPEG2 SIF

In MN1-6 modes, MPEG2 SIF has been adopted, instead of the MPEG1 SIF of conventional models. This enables higher-quality recording for longer hours.

5. Improved editing functions

For DVD, the original/play-list editing in DVD-VR mode available with conventional models is provided.

The automatic-chapter-mark-insertion function in response to a change in audio type (stereo, monaural, bilingual) makes commercial-cutting editing easier.

5. Various-format playback

Playback of WMA, MP3, and JPEG formats is supported.

6. Other functions and specifications

The following main functions and specifications adopted with conventional models are also provided with this model:

- 192-kHz, 24-bit DAC
- 48-kHz, 20-bit ADC
- Digital 3-D Y/C separation circuit
- Digital frame TBC
- 3-D DNR
- DV (iLink) input/output
- Built-in BS tuner
- Playback with commercials skipped

- CD/video-CD playback
- Picture creation
- Recording with 3/4-D1 and 2/3-D1 resolutions
- Recording mode with 32-step MNs
- LPCM recording
- High-resolution GUI
- Progressive output
- SRS TruSurround

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7.4 DISC/CONTENT FORMAT

Disc / content format playback compatibility

General disc compatibility

This recorder was designed and engineered to be compatible with software bearing one or more of the following logos:



DVD-Video DVD-R DVD-RW



Audio CD Video CD CD-R CD-RW



Fujicolor CD

Also compatible with KODAK Picture CD

 is a trademark of Fuji Photo Film Co. Ltd.

Other formats, including but not limited to the following, are not playable in this recorder:

DVD-Audio / SACD / DVD-RAM

DVD-ROM / CD-ROM*

* Except those that contain WMA, MP3 or JPEG. See also Compressed audio compatibility and JPEG file compatibility below.

DVD-R/RW and CD-R/RW discs recorded using a DVD recorder, CD recorder or personal computer may not be playable in this recorder. This may be caused by a number of possibilities, including but not limited to: the type of disc used; the type of recording; damage, dirt or condensation on either the disc or the pick-up lens. See below for notes about particular software and formats.

DVD-R/RW compatibility

This recorder will play and record DVD-R/RW discs that use DVD-Video format (Video mode), and DVD-RW discs that use the Video Recording (VR) format. It is compatible with DVD-RW Ver. 1.1 and Ver. 1.1 / 2x, and DVD-R Ver. 2.0 and Ver. 2.0 / 4x.

CD-R/RW compatibility

This recorder will play CD-R and CD-RW discs recorded in CD Audio or Video CD format, or as a CD-ROM containing MP3, WMA or JPEG files. However, any other content may cause the disc not to play, or create noise/distortion in the output.

This recorder cannot record CD-R or CD-RW discs.

PC-created disc compatibility

If you record a disc using a personal computer, even if it is recorded in a "compatible format" as listed above, there will be cases in which the disc may not be playable in this recorder due to the setting of the application software used to create the disc. In these particular instances, check with the software publisher for more detailed information.

Check the DVD-R/RW or CD-R/RW software disc boxes for additional compatibility information.

WMA (Windows Media Audio) compatibility



The Windows Media logo printed on the box indicates that this recorder can playback WMA data.

WMA is short for Windows Media Audio and refers to an audio compression technology developed by Microsoft Corporation. WMA data can be encoded by using Windows Media Player version 9 (or less) or Windows Media Player for Windows XP.

Windows Media, and the Windows logo are trademarks, or registered trademarks of Microsoft Corporation in the United States and/or other countries.

Compressed audio compatibility

This recorder will play CD-ROM, CD-R, and CD-RW discs containing files saved in the MPEG-1 Audio Layer 3 (MP3) or Windows Media Audio (WMA) format with a sampling rate of 44.1 or 48kHz. Incompatible files will not play and the message **Cannot play this file format** will be displayed (**CAN'T PLAY** in the front panel display).

Fixed bit-rate MP3 files are recommended. Variable bit-rate (VBR) MP3 files are playable, but playing time may not be shown correctly.

This recorder is compatible with 44.1 and 48 kHz WMA files encoded with Windows Media Codec 8. Files encoded using Windows Media Codec 9 may be playable, but some parts of the specification are not supported (specifically, Pro, Lossless, Voice and VBR WMA files).

WMA files encoded with DRM (Digital Rights Management) copy protection will not play and the message **Cannot play this file format** will be displayed (**CAN'T PLAY** in the front panel display).

The CD-ROM used to compile your WMA/MP3 files must be ISO 9660 Level 1 or 2 compliant. CD physical format: Mode1, Mode2 XA Form1. Romeo and Joliet file systems are both compatible with this recorder.

Use CD-R or CD-RW media for recording your files. The disc must be finalized (i.e. the session must be closed) in order to play in this recorder.

This recorder only plays tracks that are named with the file extension .MP3 or .WMA (upper or lower-case).

When naming MP3 and WMA files, add the corresponding file name extension (.mp3 or .wma). Files are played according to the file extension. To prevent noise and malfunctions, do not use these extensions for other kinds of files.

This recorder can recognize up to 99 folders and 999 files (WMA/MP3). If a disc exceeds these limits, only files and folders up to these limits will be playable. Files and folders are read/displayed in alphabetical order. Note that if the file structure is very complex, you may not be able to read/play all files on the disc.

Folder, track and file names (excluding the file extension) are displayed.

There are many different recording bit-rates available to encode MP3 files. This recorder has been designed to be compatible with all of them. Audio encoded at 128Kbps should sound close to regular CD Audio quality. This recorder will play lower bit-rate files, but please note that the sound quality becomes noticeably worse at lower bit-rates.

JPEG file compatibility

This recorder is compatible with Fujicolor CD and Kodak Picture CD formats, as well as CD-R/RW/ROM discs containing JPEG files.

Baseline JPEG and EXIF 2.2^{*1} still image files are supported (horizontal resolution from 160–5120 pixels; vertical resolution between 120–3840 pixels).

^{*1} File format used by digital still cameras

The CD-ROM used to compile your JPEG files must be ISO 9660 Level 1 or 2 compliant. CD physical format: Mode1, Mode2 XA Form1. Romeo and Joliet file systems are both compatible with this recorder.

This recorder only displays files that are named with the file extension .jpg, .jpeg, .jif, or .jiff (upper or lower-case).

The recorder can load up to 99 folders and 999 files at one time. If there are more files/folders than this on the disc then more can be reloaded.

7.5 CLEANING

A



Before shipping out the product, be sure to clean the following positions by using the prescribed cleaning tools:

| Position to be cleaned | Cleaning tools |
|------------------------|---|
| Pickup lenses | Cleaning liquid : GEM1004 Cleaning paper : GED-008 |

| Position to be cleaned | Cleaning tools |
|------------------------|--------------------------|
| Fans | Cleaning paper : GED-008 |

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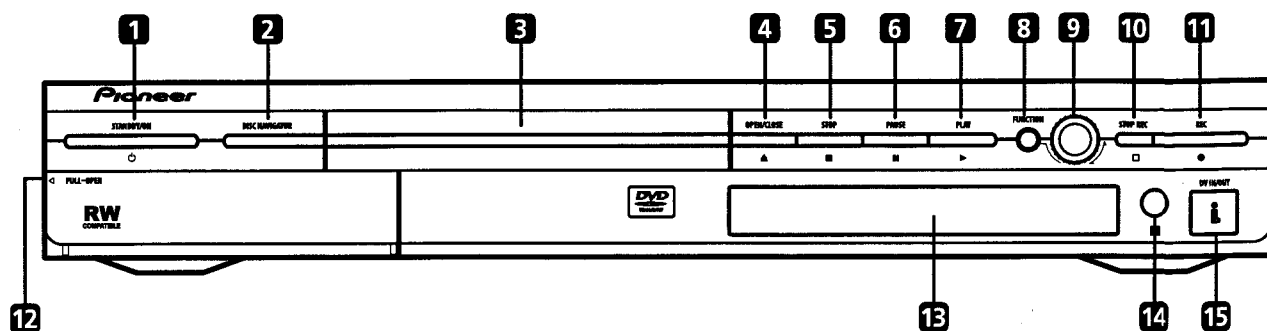
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8. PANEL FACILITIES

8.1 FRONT SECTION



1 STANDBY/ON

Press to switch the recorder on/into standby.

2 **DISC NAVIGATOR**

Press to directly access the Disc Navigator screen.

3 **DVD disc tray**

4 OPEN/CLOSE

Press to open/close the disc tray.

5 STOP

Press to stop playback.

6 PAUSE

Press to pause/restart playback or recording.

7 PLAY

Press to start or restart playback.

8 **FUNCTION**

Press repeatedly to set the function of the **SMART JOG** dial. The function is shown in the display.

9 **SMART JOG dial**

10 STOP REC

Press to stop recording.

11 REC

Press to start recording.

12 **Front panel inputs**

Pull the cover down where indicated to access the front panel input jacks. Especially convenient for connecting camcorders and other portable equipment.

13 **Front panel display**

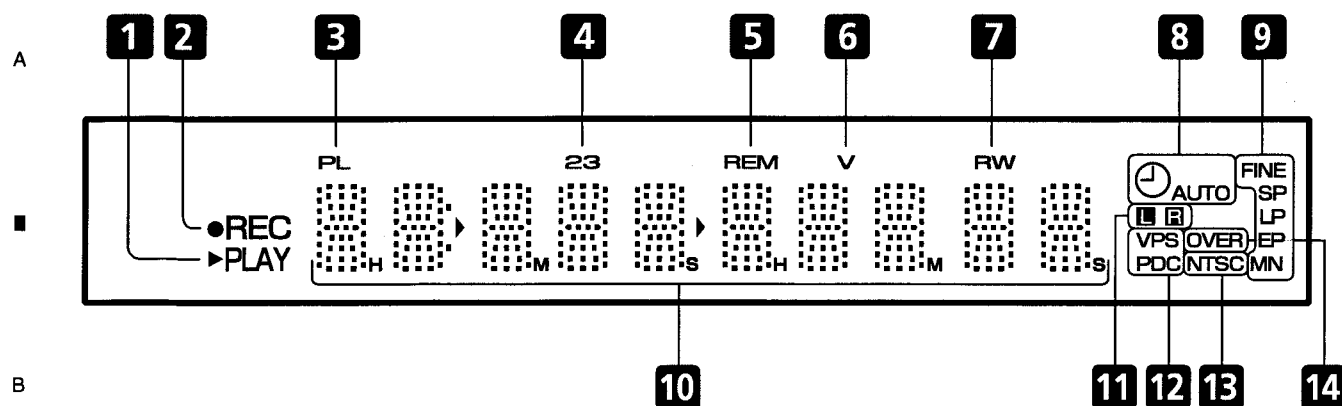
See Display for details.

14 **IR remote sensor**

15 **DV IN/OUT jack**

Digital input/output jack for use with a DV camcorder.

8.2 DISPLAY



1 ▶ PLAY

Lights during playback; blinks when paused.

2 ● REC

Lights during recording; blinks when recording is paused.

3 PL

Lights when a VR mode disc is loaded and the recorder is in Play List mode.

4 23

Shows the remote control mode (if nothing is displayed, the remote control mode is 1).

5 REM

Lights when the character display is showing the remaining available recording time.

6 V

Lights when an unfinalized Video mode disc is loaded.

7 R / RW

Indicates the type of recordable DVD loaded: DVD-R or DVD-RW.

8 ⏰

Lights when a timer recording has been set. (Indicator blinks if the timer has been set but there isn't a recordable disc loaded.)

AUTO

Lights when Auto Start Recording has been set, and during Auto Start Recording.

9 Recording quality indicators

FINE

Lights when the recording mode is set to **FINE** (best quality).

SP

Lights when the recording mode is set to **SP** (standard play).

LP

Lights when the recording mode is set to **LP** (long play).

EP

Lights when the recording mode is set to **EP** (extended play).

MN

Lights when the recording mode is set to **MN** (manual recording level) mode.

10 Character display

11 L R

Indicates which channels of a bilingual broadcast are recorded.

12 VPS / PDC

Lights when receiving a VPS/PDC broadcast during a VPS/PDC-enabled timer recording.

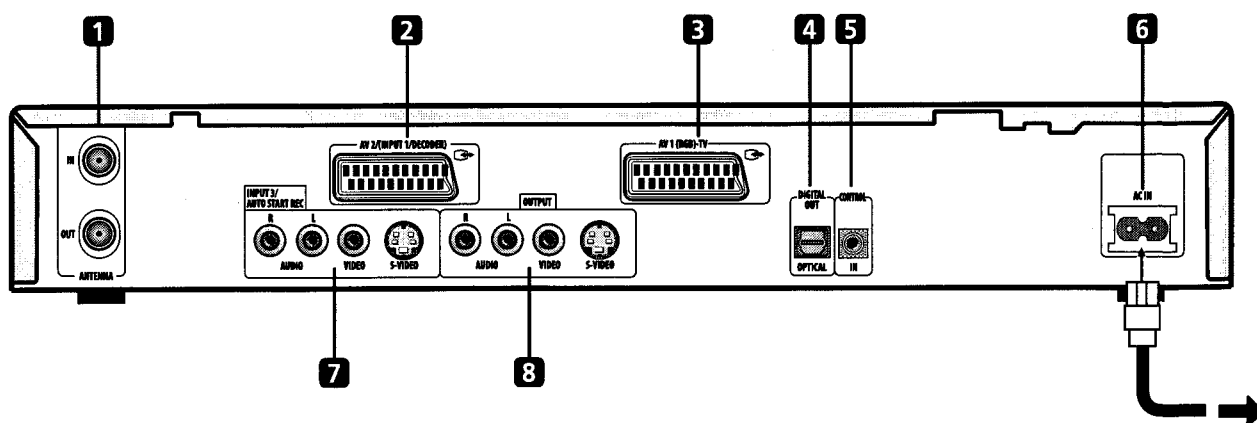
13 NTSC

Lights when the video output is NTSC format.

14 OVER

Lights when the analog audio input level is too high.

8.3 REAR PART



1 ANTENNA IN/OUT

Connect your TV antenna to the **ANTENNA IN** jack. The signal is passed through to the **ANTENNA OUT** jack for connection to your TV.

2 AV2/(INPUT 1/DECODER) AV connector

Audio/video input SCART-type connector for connecting to a VCR, or other equipment with a SCART connector. The input accepts video and S-video.


3 AV1(RGB)-TV AV connector

Audio/video output SCART-type connector for connecting to a TV or other equipment with a SCART connector. The video output is switchable between video, S-video and RGB.

4 DIGITAL OUT OPTICAL

For connecting to an AV receiver, Dolby Digital/DTS/ MPEG decoder or other equipment with optical digital input.

5 CONTROL IN

Use to control this recorder from the remote sensor of another Pioneer component with a **CONTROL OUT** terminal and bearing the Pioneer  mark. Connect the **CONTROL OUT** of the other component to the **CONTROL IN** of this recorder using a mini-plug cord.

6 AC IN - Power inlet

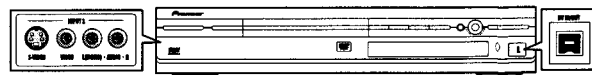
7 INPUT 3/AUTO START REC jacks

Audio/video inputs (stereo analog audio; video and S-video) that you can use to connect to a satellite receiver, TV, VCR or other source component for recording.

8 OUTPUT jacks

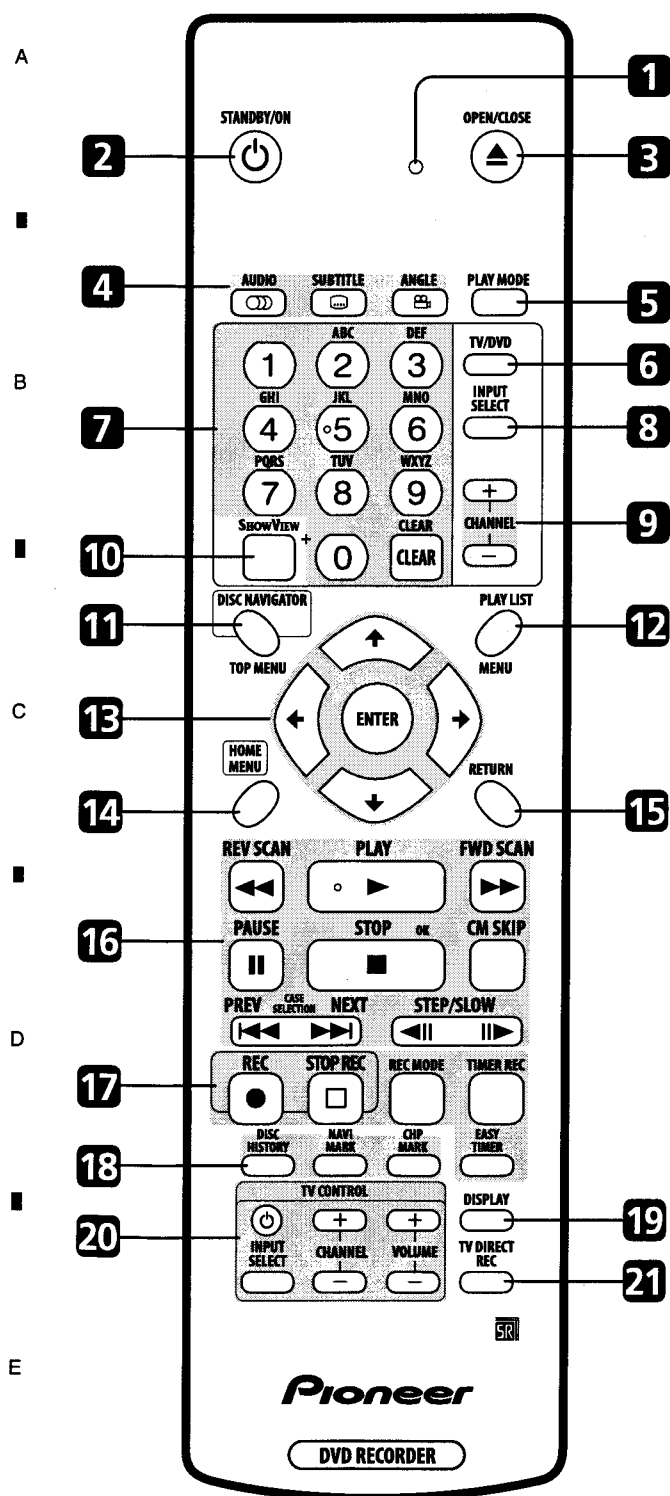
Audio/video outputs (stereo analog audio; video and S-video) that you can use to connect to a TV, monitor, AV receiver or other equipment.

Front panel connections



On the left side of the front panel a flip-down cover hides a second audio/video input, consisting of a video and S-video jack, and stereo analog audio jacks. (You can also connect a mono source using just the **L(MONO)** jack.) On the right side is the DV input/output i.LINK connector. This is for connection to a DV camcorder.

8.4 REMOTE CONTROL



1 Remote control indicator

Lights when setting up the remote control for use with a TV and when setting the remote control mode

2 **STANDBY/ON**

Press to switch the recorder on/into standby.

3 **OPEN/CLOSE**

Press to open/close the disc tray.

4 DVD playback functions

AUDIO

Changes the audio language or channel. (When the recorder is stopped, press to change the tuner audio.)

SUBTITLE

Displays/changes the subtitles included in multilingual DVD-Video discs.

ANGLE

Switches camera angles on discs with multi-angle scenes.

5 PLAY MODE

Press to display the Play Mode menu (for features such as search, repeat and program play).

6 TV/DVD

Press to switch between 'TV mode', in which you get the picture and sound from the TV's tuner, and 'DVD mode', in which you get picture and sound from the recorder's tuner (or an external input).

7 Alphanumeric buttons and CLEAR

Use the number buttons for track/chapter/title selection; channel selection, and so on. The same buttons can also be used to enter names for titles, discs and so on. Use **CLEAR** to clear an entry and start again.

8 INPUT SELECT

Press to change the input to use for recording.

9 CHANNEL +/-

Press to change the channel of the built-in TV tuner.

10 SHOWVIEW(for WYXU and WY types)

Press, then use the number buttons to enter a ShowView programming number for timer recording.

VIDEO Plus+(for WVXU type)

Press, then use the number buttons to enter a PlusCode programming number for timer recording.

11 DISC NAVIGATOR / TOP MENU

Press to display the Disc Navigator screen, or the top menu if a DVD-Video disc is loaded.

12 PLAY LIST / MENU

Press to switch between Original and Play List content on VR mode discs, or display the disc menu if a DVD-Video disc is loaded.

13 ↑ / ↓ / ← / → (cursor buttons) and ENTER

Used to navigate all on-screen displays. Press **ENTER** to select the currently highlighted option.

14 HOME MENU

Press to go display the Home Menu, from which you can navigate all the functions of the recoder.

15 RETURN

Press to go back one level in the on-screen menu or display.

16 Playback controls

◀◀ REV SCAN / FWD SCAN ▶▶

Press to start reverse or forward scanning. Press again to change the speed.

▶ PLAY

Press to start playback.

⏸ PAUSE

Press to pause playback or recording.

■ STOP

Press to stop playback.

CM SKIP

Press to skip 30 seconds forward on the disc (about the length of a typical TV commercial); press repeatedly to skip up to 4 minutes.

◀◀ PREV / NEXT ▶▶

Press to skip to the previous or next title / chapter / track / folder; or to display the previous or next menu page.

◀⏸ STEP/SLOW ⏸▶

During playback, press to start slow-motion playback; while paused, press to show the previous or next video frame.

17 Recording controls

● REC

Press to start recording. Press repeatedly to set the recording time in blocks of 30 mins.

□ STOP REC

Press to stop recording.

REC MODE

Press repeatedly to change the recording mode (picture quality).

TIMER REC

Press to set a timer recording from the standard Timer Recording screen.

EASY TIMER

Press to set a timer recording from the Easy Timer screen.

18 DISC HISTORY

Press to display summary information (disc name, recording time left, etc.) from the last 30 recordable discs loaded.

NAVI MARK

Press to select a thumbnail picture for the current title for use in the Disc Navigator screen.

CHP MARK

Press to insert a chapter marker when playing/recording a VR mode DVD-RW disc.

19 DISPLAY

Displays/changes the on-screen information displays.

20 TV CONTROL

After setting up, use these controls to control your TV.

21 TV DIRECT REC

Press to start recording whatever channel your TV is set to.

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